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Director of Education :
P. E. MEADON, M.A.

MEDICAL STAFF.

(Jointly with the Public Health Department).

County Medical Officer of Health and School Medical Officer :

J. J. BUTTERWORTH, M.D., Ch.B., D.P.H.

Chief Assistant County Medical Officers :

J. FERGUSON, B.A., M.B., Ch.B., D.P.H. (Resigned 31st May, 1929).

R. H. W. FISHER, M.A., M.R.C.S., L.R.C.P., D.P.H.

E. H. SCHOLEFIELD, M.A., M.B., Ch.B., M.R.C.S., L.R.C.P., D.P.H.

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A. C. CRAWFORD, M.B., Ch.B., D.P.H., D.T.M.

CATHERINE L. CORBETT, M.B., Ch.B., D.P.H.

H. L. CRONK, M.A., M.D., Ch.B., M.R.C.S., L.R.C.P., D.P.H.
(Resigned 30th June, 1929.)

R. M. GALLOWAY, M.D., Ch.B., M.R.C.S., L.R.C.P., D.P.H.

WINNIEFRED M. GRAY, M.A., M.B., Ch.B., D.P.H.

F. HALL, M.D., Ch.B., D.P.H., B.L.

H. HOLROYD, M.B., B.S., D.P.H.

GLADYS H. HUTCHINSON, M.B., Ch.B.

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G. G. JOHNSTONE, *M.C.*, M.A., M.D., Ch.B., D.P.H.

J. H. PORTER, M.A., M.B., Ch.B., M.R.C.S., L.R.C.P., D.P.H.

J. A. TOMB, M.B., Ch.B., D.P.H.

A. TOPPING, M.A., M.D., Ch.B., D.P.H.

G. G. WRAY, M.D., Ch.B., D.P.H.

S. N. WRIGHT, M.Sc., M.B., Ch.B., D.P.H.

Dental Surgeons :

H. J. APPLEYARD, L.R.C.P., L.R.C.S., L.D.S.

J. B. DAVIES, L.D.S.

F. J. W. DEWHURST, L.D.S.

R. E. HODGSON, L.D.S.

H. B. IVERS, *M.C.*, L.D.S. (Resigned 31st October, 1928).

J. KERSHAW, L.M.S.S.A., L.D.S.

W. A. LINNELL, L.D.S.

T. G. LLOYD, L.D.S.

I. F. MCASH, L.R.C.P., L.R.C.S., L.D.S.

G. G. MACPHEE, M.A., M.B., Ch.B., L.D.S.

F. D. MANNERS, L.D.S.

E. V. POLLITT, L.D.S.

A. W. POOLE, L.D.S.

T. H. WIGNALL, L.D.S.

A. CLEAVER, L.D.S. (part-time)

Ophthalmic Surgeons (part-time):

E. ALLAN, M.B., Ch.B.
H. H. BYWATER, M.D., Ch.B., D. Ch.O., F.R.C.S.
O. M. DUTHIE, M.D., Ch.B.
G. A. JELLY, F.R.C.S., L.R.C.P., L.S.A., D.P.H.
N. MACINNES, M.A., M.B., Ch.B.
H. G. PARKER, F.R.C.S., L.R.C.P., L.R.F.P.S.
J. F. PENMAN, M.B., Ch.B.
F. C. PLUMMER, M.D., Ch.B.
G. A. RENWICK, M.B., Ch.M.
T. SNOWBALL, M.A., M.B., Ch.B.
W. SYKES, L.R.C.P., L.R.C.S., L.R.F.P.S.
J. M. WISHART, M.B., Ch.B., F.R.C.S.

Honorary Consulting Orthopædic Surgeon:

SIR ROBERT JONES, Bart., K.B.E., C.B., F.R.C.S., L.L.D., D.Sc.

Orthopædic Surgeons (part-time):

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Assistant Orthopædic Surgeons (part time).

E. S. BRETNALL, M.B., F.R.C.S.
B. L. McFARLAND, M.D., M.Ch. (Orth.), F.R.C.S.
S. M. MILNER, M.A., M.B., F.R.C.S.
H. POSTON, M.B., M.Ch.

School Nurses and Health Visitors:

Mrs. M. ASHTON	Miss C. E. LAYCOCK
Miss S. BEACH	Miss A. LYNCH
Mrs. M. R. BECKETT	Miss M. MACDONALD
Mrs. A. BIRCHALL	Miss E. MARES
Miss A. CANTON	Miss M. R. McLEAN
Mrs. E. CHAMBERS	Miss G. MENZIES
Miss E. CUBBIN	Miss I. MILNE
Mrs. A. DEWHURST	Miss A. I. MURPHY
Mrs. H. M. DEWHURST	Mrs. B. PALIN
Miss H. DICKINSON	Miss D. H. PROCTER
Miss M. G. DICKINSON	Mrs. L. READ
Miss M. DUDLEY	Miss A. REEVES
Miss P. E. DUNN	Miss M. ROBINSON
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Mrs. M. A. HILTON	Miss M. E. SMITH
Miss S. N. HODGSON	Mrs. E. C. STRINGER
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Miss G. M. HUGHES	Mrs. F. M. TREGARTHEN
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Miss A. D. IRVING	Miss E. A. WALKER
Miss M. KENNEDY	Miss I. VALENTINE
Miss E. KNOWLES	Miss A. WALTERS
Miss M. LAMB	Miss G. J. WELLARD
Miss E. M. LAWLEY	Miss S. E. WRIGHT

Orthopædic Nurses:

Miss F. CORNES Miss E. H. ELKINGTON
Miss E. J. HINKLEY

BIDDULPH GRANGE ORTHOPÆDIC HOSPITAL.

Senior House Surgeon:

MARGARET H. GREG, M.R.C.S., L.R.C.P.

Matron:

Miss M. ROCHELL



LANCASHIRE EDUCATION COMMITTEE.

SCHOOL MEDICAL SUB-COMMITTEE.

TWENTIETH
ANNUAL REPORT
OF THE
COUNTY MEDICAL OFFICER OF HEALTH
AND
SCHOOL MEDICAL OFFICER,
For the Year ended 31st December, 1928.

The following Report on the work of the School Medical Service follows in its arrangement the lines laid down by the Board of Education.

ADMINISTRATION.

The area of the Administrative County of Lancaster for Elementary Education purposes is 942,742 acres, and the population is 965,760, of whom the average number on the Roll of Elementary Schools is 131,929, and the average number in attendance is 115,831; the average attendance in the previous year was 116,457.

For Higher Education and General Purposes the population is 1,812,220, while for Child Welfare purposes it is 744,988.

The rural part of the County is mainly north of the River Ribble and to the west of a line drawn roughly from Preston to Liverpool, whilst the urban districts cluster most thickly in the southern and eastern portions of the County.

The following districts are autonomous for Elementary Education purposes and, therefore, do not come within the scope of this Report except for Higher Education :—

19 Municipal Boroughs ;

the Urban Districts of Chadderton, Farnworth, Hindley, Ince-in-Makerfield, Radcliffe, Stretford, Swinton and Pendlebury, and Waterloo-with-Seaforth.

The combined population of these Boroughs and Urban Districts is estimated to be 846,460.

Of the 682 schools for which the Lancashire Education Committee is responsible, about two-thirds are distant from the nearest railway station one to nine miles.

During the year there has been no change in the medical staff.

Three of the School Nurses and Health Visitors—Miss N. C. Buchan, Miss G. Coward and Miss M. C. Williams—resigned and their places have been filled by the appointment of Miss P. E. Dunn, Miss M. Fawcett and Miss I. Valentine. On the absorption into the County Council's Scheme of Oswaldtwistle, which had formerly been responsible for its own maternity and child welfare work, Nurse A. Townend, who had been the Health Visitor in Oswaldtwistle was absorbed into the County Council's staff.

The services of Mr. H. B. Ivers (resigned) have been lost to the Committee's Dental Scheme, and his place has been filled and the Dental staff further enlarged by the appointment of Dr. H. J. Appleyard, Mr. J. B. Davies, Mr. F. J. W. Dewhurst and Mr. A. W. Poole.

Several small outbreaks of smallpox again interrupted considerably the work of Medical Inspection.

CO-ORDINATION OF THE WORK OF THE SCHOOL MEDICAL SERVICE WITH THAT OF OTHER HEALTH SERVICES.

The arrangements for co-ordination have been fully described in previous Annual Reports. The Assistant School Medical Officers are Assistant Medical Officers of Health for the County, and are in touch with the Medical Officers of Health of the local Sanitary Authorities in their respective districts. The School Nurses are also Health Visitors. The following table shows the work done by the Nurses as Health Visitors during the year 1928 :—

HOME VISITS—

(Infants under one year)—

No. of 1st Visits	10,208
No. of Re-visits	42,651

(Children 1—5 years of age)—

No. of Visits	34,312
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ANTE-NATAL WORK—

(Expectant Mothers)—

No. of 1st Visits	2,068
No. of Re-visits	2,097

OTHER VISITS—

Special Visits to Older Children, Medical Officers of Health, &c.	1,416
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VISITS TO CASES OF OPHTHALMIA NEONATORUM AND OTHER MATTERS.	516
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During the year two new Child Welfare Centres were opened or taken over from Local Authorities which had joined the County Council's Scheme for Maternity and Child Welfare, and the list of those which have now been established is as follows :—

Abram	Clayton-le-Moors	Kirkham	Poulton-le-Fylde
Adlington	Clifton	Leyland (2)	Prescot
Aspull	Coppull	Little Lever	Rishton
Atherton	Crompton	Littleborough	Skelmersdale
Audenshaw	Dalton-in-Furness	Longridge	Standish
Barrowford	Davyhulme	Litherland	Thornton
Bamber Bridge	Droylsden	Milnrow	Tottington
Billinge	Feniscowles	Morecambe	Ulverston
Blackrod	Fleetwood (2)	Norden	Urmston
Briercliffe	Flixton	Ormskirk	Walkden
Bromley Cross	Haydock	Orrell	Waterloo
Burtonwood	Irlam (2)	Oswaldtwistle (2)	Whitefield
Church	Kearsley	Padiham	Whitworth

Some of these Child Welfare Centres have been taken over from Local Sanitary Authorities which had previously established them, and in a few of these cases the visiting Medical Officer is the local Medical Officer of Health. In all cases, however, the Health Visitor and Superintendent Nurse of the Welfare Centre has become a School Nurse for her district in the County.

Voluntary Helpers, as in the past, continue to do good work at these Centres. Instruction in Mothercraft is given to older girls from Elementary Schools in the districts of Leyland, Longridge, Urmston, and other districts, on a definite plan arranged between the Elementary Education Department and the Medical Department. The instruction is systematic and is a very valuable training for older girls in some of their future responsibilities.

The following table gives a statistical summary of the work done in the Centres during the past year :—

SUMMARY OF ATTENDANCES, &C., AT CHILD WELFARE CENTRES DURING THE TWELVE MONTHS ENDED 31ST DECEMBER, 1928, TOGETHER WITH THE NUMBER OF BIRTHS NOTIFIED DURING THAT PERIOD.

Name of Child Welfare Centre.	No. of Times Open.	No. of Births Notified during the 12 months.	No. of individual children attending.			No. of attendances by children.			No. of attendances by expectant mothers.		No. of attendances by other women.	
			Under 1 year old.	From 1—2 years old.	Over 2 years old.	Under 1 year old.	From 1—2 years old.	Over 2 years old.	No. of individual expectant mothers attending.	No. of actual attendances.	No. of individual women attending.	No. of actual attendances.
Abram	24	118	89	40	52	630	264	327	17	54	28	52
Adlington	46	62	65	44	65	733	536	887	6	75	30	262
Aspull (New Springs) ...	47	145	189	79	17	1788	759	88	54	182	20	147
Audenshaw	48	103	138	98	81	1589	579	476	7	25	12	284
Bamber Bridge	48	59	106	60	118	777	492	784	30	169	100	312
Barrowford	48	70	72	48	59	520	138	203	7	16	19	25
Billinge	48	56	49	58	53	459	417	371	18	83	20	77
Blackrod	48	64	51	44	14	380	482	93	7	22	15	69
Briercliffe	23	17	41	30	34	277	105	182	3	11	4	7
Bromley Cross	47	15	95	50	102	655	212	270	16	46	27	260
Burtonwood	48	42	44	30	24	410	231	128	6	19	12	92
Church	46	69	112	67	50	1118	310	468	6	24	15	144
Clayton-le-Moors	46	149	83	45	31	746	385	317	13	72	26	239
Clifton	47	23	33	23	15	648	409	261	3	41	7	55
Coppull	46	86	101	50	72	994	492	635	36	132	11	428
Crompton	47	179	153	94	38	1701	711	301	9	19	31	48
Dalton-in-Furness	48	189	190	99	152	1512	924	1135	80	409	...	...
Davyhulme	43	33	44	23	20	423	218	197	6	43	4	19
Droylsden	48	168	300	120	103	4262	1005	641	12	48	21	323
Feniscowles	48	9	27	19	27	202	91	158	4	19	10	57
Fleetwood (No. 1)	47	476	144	69	68	1244	422	460	11	63	10	31
Fleetwood (No 2)	48		283	113	136	2030	531	657	18	61	1	2
Flixton	45	99	116	66	61	1547	433	474	14	46	20	200
Haydock	48	252	128	39	30	1257	343	124	40	130	10	22
Irlam (Prim. Meth.)	24	226	140	60	27	1292	414	93	16	34	30	330
Irlam (Long. Ldge.)	24		135	63	36	1005	424	171	17	35	26	277
Kearsley	48	143	171	89	80	1508	676	225	9	58	10	74
Kirkham	48	71	109	64	31	866	443	171	7	28	15	92
Leyland (Brad. St.)	23	133	19	13	28	151	109	246	6	26	12	129
Leyland (Quin St.)	46		91	72	83	937	567	1115	11	72	17	456
Litherland	48	238	230	88	180	1720	589	1354	21	130	33	51
Littleborough	48	135	193	76	80	1776	422	340	16	54	10	65
Little Lever	48	66	77	34	16	816	235	54	13	32	53	121
Longridge	29	57	102	61	45	651	193	144	13	69	10	78
Milnrow	48	81	111	67	55	1330	524	250	8	44	6	59
Morecambe	48	153	196	99	45	1367	669	445	22	83	...	...
Norden	48	30	68	44	52	957	613	472	16	102	25	359
Ormskirk	48	131	108	58	67	1184	568	596	20	86	7	29
(a) Oswaldtwistle	36	161	95	38	26	654	221	43	12	66	67	1336
Padiham	47	167	106	43	47	804	198	296	4	10	13	15
Poulton-le-Fylde	25	39	51	26	30	295	140	128	3	19	20	25
Prescot	70	194	253	87	89	1966	611	616	93	172	19	64
Rishton	47	75	65	35	21	300	176	99	...	...	7	116
Skelmersdale	48	111	64	38	63	740	409	476	8	33	25	191
Standish	48	104	116	58	95	1082	621	719	20	93	64	181
Thornton	47	156	100	41	63	715	228	464	8	59	23	81
Tottington	47	67	81	46	49	753	278	240	5	23	7	61
Ulverston	48	123	150	102	122	1300	1089	1048	49	340	...	...
Urmston	48	99	49	16	27	492	125	119	4	30	30	79
Walkden	48	99	172	51	35	1596	306	121	4	5	48	184
Waterloo	28	38	59	31	19	414	153	93	1	6	13	31
Whitefield	44	86	131	70	40	1253	538	277	9	16	...	...
Whitworth	47	111	71	34	40	982	424	559	12	110	8	98

(a) Included in County Scheme for Maternity and Child Welfare Work as from 1st April, 1928.

The supply of dried milks or milk powders at the Centres is continued on the same terms as described in the Annual Report for 1925, and there is also an extensive scheme for the provision of fresh milk to expectant or nursing mothers and to young children. Every medical man agrees that the best food for the baby is the natural supply, and it is regrettable that some mothers only begin their attendances at the Centres when the natural supply has failed and artificial feeding has begun.

On this account there is a natural tendency on the part of mothers and others to look upon Child Welfare Centres as shops for the supply of dried milk and patent foods. This tendency requires constant correction; the real function of these centres is not that of a cheap shop or of a substitute for the Relieving Officer. Nor are they places where the diagnosis and treatment of the ailing baby is the chief aim. They are Centres for the inspection of babies and for the guidance of mothers in the normal rearing and upbringing of their children, where any departure from the normal can be observed and advice given, but no treatment undertaken. In a word, their proper aim is education.

During the year 1928, 539,783 pints of fresh milk were supplied directly to the recipients by milk purveyors and the following tabular statement shows the amount of dried milks, cod liver oil, Virol, etc., supplied at the Centres :—

No.	Units.	Article of Foodstuff.	Cost.
			£ s. d.
27,815	1 lb. packets	Cow and Gate	2,087 0 2
13,313	8 oz. tins	Virol	665 13 0
10,351	1 lb. packets	Glaxo	805 9 6
8,243	1 lb. cartons	C. L. O and Malt	318 16 9
5,423	1 lb. packets	Ambrosia	403 15 0
3,421	1 lb. packets	Ostermilk	259 2 4
3,168	1 lb. bottles	Horlick's M. Milk	399 18 0
1,090	7 oz. tins	Virolax	53 19 4
1,122	1 lb. tins	Almata	109 7 3
906	8 oz. bottles	Aberdeen Emulsion	34 0 4
788	8 oz. tins	Ovaltine	53 3 10
684	1 lb. bottles	C. L. O. Emulsion	44 11 6
578	4 oz. bottles	Cod Liver Oil	11 18 0
375	1 lb. packets	Irradiated Glaxo	28 5 0
410	1 lb. tins	Milkal	30 7 4
387	1 lb. jars	Radio Malt	25 18 3
233	...	Sacker's Combs	26 4 3
301	4 oz. tins	Lactagol	17 9 7
192	1 lb. tins	New Zealand Cream	23 2 0
176	8 oz. tins	Ostelin Malt	7 6 4
90	...	Booklets	1 10 0
165	1 lb. tins	Dextri Maltose	8 3 9
106	8 oz. bottles	Liquid Paraffin	3 11 6
29	1 lb. cartons	Vitamine Malt	1 5 7
31	4 oz. packets	Groats	0 7 9
79,397			£5,420 6 4

Ante-natal Clinics are in operation at Irlam and Litherland, and arrangements have also been made with the Borough of Widnes for the attendance at their Clinic of expectant mothers from the adjacent County area. These have been established with the object

(1) of reducing maternal mortality and morbidity which are still excessive.

(2) With the object of giving advice concerning the mother's diet, so that healthy babies will result from the pregnancies.

The importance of correct feeding during pregnancy cannot be too deeply impressed upon the mothers.

All recent research shows, to take one instance only, that the quality of the child's teeth depends to a large extent upon the mother's diet during pregnancy. Any determined onslaught on the prevention of dental caries would have to begin by treatment of or advice to the pregnant woman.

Dr. Barker reports as follows on the progress made in the Litherland Ante-Natal Clinic during the last two years :—

The Litherland Ante-Natal Clinic, which was started in January, 1927, has been open 46 times during the two years.

The institution of an ante-natal clinic is a new departure in the Health activities of this district, and constitutes part of the effort that is being made to cope with high maternal mortality.

The ideal arrangement would be one in which every expectant mother came, since an early period in her pregnancy, under competent medical supervision, so that any abnormalities or diseases of that condition could be detected early, and so dealt with that she would pass safely through parturition and the puerperal period.

In the case of the patient who is in good circumstances, this ante-natal care would be given by the family doctor, who is engaged to attend the confinement; but in the case of poorer patients, who generally make arrangements to be attended by Midwives, this ante-natal Medical supervision is not so easily obtainable. Most of these expectant mothers do not know, or realise, that care of this sort is needed, and it is for these patients that ante-natal centres are required. There they are received, examined and advised. Conditions which add to the discomforts of pregnancy, difficulty in labour, or the reason why they have had unfortunate experiences in past labours are explained to them, and all means are taken to help them, and to ensure them as satisfactory a confinement as possible.

In addition the importance of a healthy mouth is explained to them, and dental treatment given when necessary.

In this way the poorer patients are gradually being educated to realise the great importance of ante-natal care.

The rate of extension of this education in a district may be taken as a test of the success of its ante-natal centre.

On studying the "Source of patient" entry on the case cards certain interesting facts come to light, which show a gradually changing attitude of mind on the part of the patients.

In the early days of its institution, the expectant mother of the district regarded the clinic with suspicion.

The local Midwives were invited to visit it, and its objects were fully explained to them. They induced a few of their patients to attend, but the women were still apprehensive and often the attendances at the ante-natal clinic were only obtained by very strenuous and persuasive efforts on the part of the County Health Visitors.

At the end of the first year the Clinic had been open 22 times. 67 expectant mothers had attended, and had put in 172 attendances altogether—an average of rather more than 7 patients per session.

During 1928 the Midwives have brought patients as before, and the Health Visitors have continued their efforts, but a perceptible change has been noticed in the spirit in which patients have attended.

Many of the expectant mothers have come to the Welfare Centre to ask particulars of the ante-natal clinic, and on enquiry it has been found that they have either come on their own initiative, or have been advised to come by friends who have themselves already attended, and derived benefit from it. This tendency has been specially noticeable during the last 6 months of 1928. It may be taken as an indication of the measure in which the Litherland Ante-Natal Clinic is becoming a success.

During 1928 the ante-natal clinic was opened 24 times, and 71 expectant mothers attended. Though this number is only slightly larger than that of the previous year, it must be noted that these patients made altogether 248 attendances, an average of over 10 per session.

Of the mothers who attended during the past two years,—

- 81 had a normal confinement at home attended by Midwives.
- 17 were transferred to Maternity Hospitals and confined there.
- 17 were attended by private doctors, either by previous arrangement, or because some unforeseen accident of labour occurred.
- 5 children were stillborn.
- 3 sets of twins.
- 2 miscarriages.
- No maternal deaths.
- 11 still attending.
- 6 no information.

During the year expectant mothers were seen by the doctors or nurses at either Ante-natal Clinics or Child Welfare Centres on 3,950 occasions.

All cases of Ophthalmia Neonatorum, a virulent inflammation of the eyes in the newly-born, are investigated immediately. It is a standing instruction to the nurses that, if necessary, all other work must be put on one side in order that efficient treatment may be given to these cases, so that the terrible consequence of blindness may be avoided.

In the Public Health (Ophthalmia Neonatorum) Regulations, 1926, which came into operation on October 1st, 1926, the duty of notifying cases is placed on the Medical Practitioners. Under the rules of the Central Midwives Board it is still the duty of the Midwife to call in a Medical Practitioner in all cases of inflammation of the eyes, however slight, and to send notice thereof to the Local Supervising Authority, which is, in this case, the Midwives Act Committee of the County Council.

The Assistant School Medical Officers, in their capacity as Assistant Medical Officers of Health, have undertaken the inspection of Maternity Homes in their respective districts. During the year 30 Maternity Homes were inspected by them and the results reported to the Public Health Department of the County Council.

The County has delegated the supervision of Maternity Homes in their districts to the following Local Authorities :—

Accrington (B.)	Lancaster (B.)
Ashton-under-Lyne (B.)	Leigh (B.)
Baeup (B.)	Lytham Saint Annes (B.)
Chorley (B.)	Middleton (B.)
Clitheroe (B.)	Morecambe and Heysham (B.)
Colne (B.)	Nelson (B.)
Darwen (B.)	Rawtenstall (B.)
Eccles (B.)†	Stretford U. D.
Heywood (B.)	Swinton and Pendlebury U. D.

OPHTHALMIA NEONATORUM.

Information regarding condition of Eyes, obtained by re-visits, after a lapse of from 2 months to 3 years from date of first report.

	YEAR 1924.		YEAR 1925.		YEAR 1926.		YEAR 1927.	
	*All "Eye Cases."	Notified as Oph. Neon.	*All "Eye Cases."	Notified as Oph. Neon.	*All "Eye Cases."	Notified as Oph. Neon.	*All "Eye Cases."	Notified as Oph. Neon.
Total number of "Eye Cases" reported to the Local Supervising Authority under the Midwives Acts	328	...	299	...	344	...	381	...
Total number of cases notified as Ophthalmia Neonatorum ...	...	154	...	147	...	172	...	211
Information regarding condition of eyes after a lapse of from 2 months to 3 years from date of first report :—								
Totally Blind	1	1	...	...	...	...	...	...
One Eye Blind ... ..	...	...	...	...	...	...	...	...
R. Blind—L. Keratitis ... ..	...	...	...	...	...	...	...	...
R. Blind—L. Nebula ... ..	...	...	...	...	...	...	1	1
L. Blind—R. Nebula ... ..	...	...	...	...	...	...	...	...
R. Blind—L. Weak	2	2	...	...	...	...	...	...
L. Blind—R. Weak ... ..	...	...	...	...	...	...	...	...
R. Blind—L. Normal	2	2	1	1	...	...	...	...
L. Blind—R. Normal	1	1	3	3	...	...	...	...
R. Blind—L. Myopia ... ..	...	...	...	...	...	...	...	...
L. Blind—R. Defective ... ..	...	...	...	...	...	...	...	...
Congenital Anophthalmos ...	1	...	...	...	1	...	...	...
Nebula (both eyes) ... ..	...	...	...	...	...	...	...	...
R. Nebula—L. Normal	1	1	...	...	2	1	...	...
L. Nebula—R. Normal ... ..	...	...	...	...	1	1	1	1
L. Large Opacity—R. Normal ...	1	1	...	...	...	...	...	...
Slight Opacity (one Eye) ... ..	...	...	...	...	2	2	1	...
Corneal Opacity (both eyes) ...	...	...	...	...	...	...	...	...
Squint (both Eyes) ... ..	...	...	...	...	...	...	...	...
R. Squint—L. Normal ... ..	...	...	...	...	3	2	...	...
R. Squint—L. Nebula ... ..	...	...	...	...	...	...	...	...
L. Squint—R. Normal ... ..	...	...	2	1	2	1	...	...
Marked Internal Squint ... ..	...	...	...	...	...	...	...	...
R. Squint—Eyes discharging ...	...	...	...	...	...	...	...	...
R. Squint, Corneal Opacity— L. Normal ... ..	...	...	...	...	1	1	...	...
L. Squint, Nebula—R. Normal ...	...	...	...	...	1	1	...	...
R. Weak—L. Normal ... ..	...	...	1	1	...	...	...	...
L. Weak—R. Normal	4	1	...	...	...	...	...	...
Both Eyes Weak	1	...	5	4	...	...	1	1
Occasional Conjunctivitis ... ..	...	...	2	2	1	...	5	2
Eyes Discharging	1	1	...	...	...	...	...	...
Eyelids Inflamed ... ..	...	...	...	...	...	...	...	...
L. Blepharitis—R. Normal	1	...	...	...	1	1	...	...
Blepharitis (both eyes) ... ..	...	...	1	1	1	...	1	...
R. Defective ... ..	...	...	...	...	...	...	...	...
L. Defective ... ..	...	...	...	...	1	1	...	...
Vision Unsatisfactory ... ..	...	...	...	...	...	...	...	...
Myosis ... ..	...	...	...	...	...	...	...	...
L. Normal—R. Cataract ... ..	...	...	1	1	...	...	...	...
Adherent Iris ... ..	...	...	...	...	...	...	...	...
L. Ptosis—R. Normal ... ..	...	...	...	...	...	...	...	...
Eyes Normal	234	107	229	97	254	123	311	170
Children Deceased	39	19	32	21	35	20	26	17
Left District, No Information, or still under treatment	39	18	22	15	38	18	34	19
	328	154	299	147	344	172	381	211

* Includes all cases in which Certified Midwives called in Medical Practitioners on account of inflammation of, or discharge from, the eyes.

For the actual confinement of women the Maternity and Child Welfare Sub-Committee and the Midwives Act Committee have shouldered a considerable amount of responsibility. In all labours which are not following a normal course it is the duty of a Midwife to advise the summoning of a doctor, and, where the doctor has been summoned by the Midwife, the Midwives Act Committee will pay the doctor's fees when the patient or her husband is unable to do so. Several Nursing Associations which provide Maternity Nurses are subsidised in proportion to the number of cases which they attend annually. The Maternity and Child Welfare Sub-Committee has made arrangements with nineteen Maternity Hospitals or Homes throughout the County whereby parturient women are admitted on such terms as they can afford, the County Council paying the balance of the fee. To these Maternity Hospitals or Homes two types of cases are admitted, those in which there is any reason to anticipate an abnormal or dangerous labour, and those whose home surroundings are not such as will allow the labour to be conducted with decency or with safety to the mother. In each case a strict investigation is made into the financial circumstances before authority is granted to enter the Hospital or Home.

Under the new Local Government Act, whereby some Hospitals will come under the control of the County, it will perhaps be easier for cases attending Ante-Natal Clinics to gain more rapid admission to Hospital than is now possible.

The following table shows the reduction in infantile mortality, per thousand births, which has taken place in recent years in the Administrative County :—

1913 ...	124	1921 ...	88
1914 ...	112	1922 ...	85
1915 ...	119	1923 ...	80
1916 ...	99	1924 ...	81
1917 ...	96	1925 ...	82
1918 ...	100	1926 ...	80
1919 ...	93	1927 ...	73
1920 ...	91	1928 ...	69

THE CARE OF DEBILITATED CHILDREN UNDER SCHOOL AGE.

There is no Routine Inspection of these children, but inspection and treatment are available for them at Child Welfare Centres, School Clinics, Orthopaedic Clinics, Ophthalmic Clinics, Dental Clinics, and at Hospitals for the operative treatment of Tonsils and Adenoids. These children come under the observation of the School Nurse and Health Visitor in the course of the home visits and many of them are found in the Schools from the age of three onwards.

During 1928 the Nurses, as School Nurses, visited 16,055 separate homes, and as Health Visitors made 93,268 visits to homes. While the specific object of each one of these home visits may have been to see a particular child, either as school child or as a baby, all the children at home would normally be seen, especially if they were causing any anxiety to their parents or presenting obvious signs of disease. During the year 3,013 children between two and five years of age made 20,611 attendances at the Child Welfare Centres.

Children under the age of three years, and in exceptional circumstances, from three to five years, can be provided under the County Council Maternity and Child Welfare Scheme with fresh or dried milk, cod liver oil and malt or Virol at cost price, less than cost price, or free, when they are certified by the Medical Officers in charge of the Child Welfare Centres to require extra nourishment.

During the last financial year a sum of £12,000 was so spent on these children.

In districts where the County Council is the Authority which is responsible for Maternity and Child Welfare, all the facilities provided for the care and treatment of school children are available for children who are not yet of school age. It is the practice of the School Medical Sub-Committee of the Education Committee and of the Maternity and Child Welfare Sub-Committee of the Public Health Committee to make identical arrangements for the treatment of the children for whose care they are respectively responsible, financial adjustments between the two Committees being made according to very simple regulations. For example, the scheme for dealing with Cripples is a joint scheme of the School Medical Sub-Committee and of the Maternity and Child Welfare Sub-Committee, and treatment is available for the child, whatever its age. Where dental facilities have been provided they are available for expectant and nursing mothers and for children under school age.

PLAYGROUNDS.

As a result of the recent decision in the High Court of Justice the Committee have included an amount in their Estimates for 1929-1930 in order to make contributions towards the cost of putting down a new class of surface to the playgrounds of non-provided schools where the existing surface is of earth or cinders. The

resumption of the Committee's assistance to managers should have the effect, in many schools, of improving the amenities of the children and of obtaining a better standard of cleanliness in the schools where such improvements are carried out.

During the year negotiations for the purchase of land for playing fields at Burtonwood, Denton, Littleborough, Orrell and Ulnes Walton have been entered into.

In the new schools projected the policy of the Committee is as follows :—

Size of Sites for Schools.

The areas given below are considered as the minimum requirements for sites for new Elementary Schools. It is assumed that the shape and situation of the site provide facilities for economical planning of the building, playgrounds and playing-fields.

The schools are grouped in three divisions according to the number of children accommodated :—

(I.) If provision is made for 200 children—					
Area required : Minimum area for building and play-ground (as required by Board of Education) ...					
					¼-acre
<i>Add</i> : School Garden and Infants' Plot ...					
					1000 sq. yards
Special Subjects Rooms ...					
					200 „
Playing-field ...					
					2 acres
Total ...					
					2½ acres

A playing-field of this size would give room for one football or hockey ground, and for minor games such as rounders or net-ball.

(II.) If provision is made for 400 children—	
Minimum area required : 3½ acres.	
This will give a larger area for the building, playground, school garden, and Special Subjects Centre, with one football or hockey ground, a cricket pitch, and space for minor games.	

(III.) If provision is made for 600 children—	
Minimum area required : 4½ acres.	
This allows for separate football and hockey grounds, in addition to the facilities given above.	

Addition for a Group of Schools.

If a playing-field is to be used for Organised Games by a number of schools in addition to the school to which it is attached, about three acres additional to the figures given above would be needed.

Central Schools.

As all the pupils will be eleven years of age or over the minimum area of a site for this purpose should be five acres.

SCHOOL HYGIENE.

There is room for great improvement in the cleanliness of the schools. Care-takers are frequently untrained and, in non-provided schools at any rate, only give part time service. In addition their work is frequently undone by the use or misuse which is made of the schools out of school hours. Occasionally structural defects like unplastered walls, uncovered rafters, rough floors, inaccessible ledges and heavy furniture give rise to an accumulation of dust which is merely disturbed by spasmodic efforts aimed at its removal and soon settles again in the same situations.

The following list shows some of the minor improvements in school premises which have been carried out during the year :—

NOTE.—The item “reflooring” is intended to cover either the whole school floor or a classroom.

District No.	Name of School.	Particulars of Improvements.
1	Dalton-in-Furness Nelson Street Council	Provision of shed and additional entrance in connection with the Child Welfare Centre.
	Coniston C.E. ...	Reflooring.
	Urswick Grammar ...	Reflooring.
	Dalton-in-Furness, Lindal and Marton Council	Installation of electric light.
	Ulverston, Sandside Council ...	Removal of gallery and reflooring.
	Dalton-in-Furness Our Lady R.C.	Erection of partition.

District No.	Name of School.	Particulars of Improvements.
2	Thurnham, Glasson C.E. ... Over Wyresdale, Abbeystead Endowed	Reflooring. Covered play-shed.
3	Great Eccleston R.C. ...	Reflooring.
4	Carleton C.E. ... Fleetwood Blakiston Street C. ... Thornton Church Road Council ...	Installation of electric light. Replacement of obsolete and insanitary lavatory basins. Provision of new lavatory basins in Mixed Dept.
5	Kirkham C.E. ... Kirkham and Wesham Council ... Marton, Little Marton C.E. ... Freckleton C.E. ...	Reflooring. Repairs to playground. Insertion of four hoppers. Repairs to roof.
7	Bamber Bridge St. Saviour's ... Walton-le-Dale, Brownedge R.C.... Walton-le-Dale School Lane C.E. Walton-le-Dale, Lostock Hall C. Banks St. Stephen's ... Tarleton Mere Brow C.E. ...	Installation of electric light. Reflooring. Reflooring. Electric light. Reflooring. Reflooring.
8	Wiswell Barrow Congregational ...	Reflooring.
9	Oswaldtwistle, Knuzden St. Oswald's Clayton-le-Moors St. Mary's R.C. Rishton Primitive Methodist ... Rishton Wesleyan ... Oswaldtwistle Happingsides ... Oswaldtwistle Happings Vale C.E. Oswaldtwistle New Lane C.E. ... Great Harwood St. Wulstan's R.C.	Rebuilding of offices. Renewal of lavatory basins and splash sheets. Reflooring and electric light. Reflooring. Reflooring. Installation of electric light. Installation of electric light. Installation of electric light.
10	Billington, Langho ... Salesbury ... Belthorn Independent ...	Installation of electric light. Reflooring. Reflooring.
11	Briercliffe Council ... Brierfield Walter Street Council ... Brierfield Wesley Street ...	Reflooring. Reflooring and new sink top. Reflooring and new stone steps.
12	Foulridge C.E. ... Barrowford C.E. ...	Improvements to ventilation. Installation of electric light.
13	Dunnockshaw, Clowbridge C.E. ... Hapton C.E. ...	Removal of vestibule and erection of porch. Removal of gallery.
14	Heapey, White Coppice C.E. ... Coppull Moor C.E. ... Charnock Richard C.E. ... Coppull St. Oswald's R.C....	Reflooring. Reflooring. Reflooring. Reflooring.
15	Brindle St. Joseph's R.C. ...	Reflooring.
16	Ormskirk St. Anne's R.C. ...	Reflooring.
18	Shevington, Crook Council ...	Erection of partition.

District No.	Name of School.	Particulars of Improvements.
19	Upholland, Digmoor Upholland Roby Mill C.E. Billinge C.E. Billinge Birchley R.C. Ashton-in-Makerfield Evans' C.	Reflooring. Reflooring. Reflooring (Infants' Dept.). Installation of electric light. Erection of two folding screens. Additional latrines accommodation for Girls, Infants and Teachers.
20	Turton Walmsley C.E. Turton Belmont Council	Reflooring. New doors to W.C.'s.
21	Horwich Lee Lane Council Horwich St. Catherine's C.E. Westhoughton, Chequerbent C.E. Westhoughton Hart Common C.E. Westhoughton Parochial C.E. Horwich Chorley New Road C. Westhoughton P. Westhoughton, Hulton C.E.	Reflooring. Reflooring. Reflooring. Reflooring. Reflooring. Removal of galleries. Erection of new partition. Erection of partition.
22	Kearsley Mount Wesleyan Little Lever Congregational Kearsley West Council	Installation of electric light. Provision of kitchen. Installation of electric light. Installation of electric light.
23	Ramsbottom, Hazlehurst C. Ramsbottom, Peel Brow C.	Removal of gallery. Removal of galleries.
24	Ainsworth C.E.	Improvement of lighting.
25	Prestwich St. Hilda's C.E. Unsworth C.E.	Reflooring. Installation of electric light.
26	Littleborough Dearnley C.E. Milnrow Newhey C.E. Wardle Smallbridge C.E. Littleborough Central Council Milnrow Newhey Council	Erection of partitions. Reflooring. Reflooring. Repairs to playground. Installation of electric light.
29	Prescot R.C. Windle Moss Bank C.E. Prescot Council	Reflooring. Reflooring. New exit gates and erection of coke stove.
30	Great Sankey Council Penketh Council	Installation of electric light. Installation of electric light.
31	Tyldesley Central C.E. Atherton Bolton Road	Reflooring. Reflooring.
32	Golborne Parochial Culcheth, Glazebury C.E.	Reflooring. Installation of electric light.
33	Urmston English Martyrs' R.C. Davyhulme C.E. Flixton Parochial Urmston Council	Installation of electric light. Installation of electric light. Installation of electric light. Installation of electric light.
34	Worsley, Boothstown C.E.	Installation of electric light.
35	Denton and Haughton C.E. Failsworth C.E. Waterloo Christ Church	Installation of electric light. Reflooring. Reflooring.

CLOAK-ROOM ACCOMMODATION.

Attention is called by some Medical Officers to the need for proper drying accommodation in the schools. It is a common thing to find that the cloak-room is at the entrance or acts as a porch for the whole school. The outer door is generally left open and any wet overcoat hung up is bound to be still wet and cold when the child comes to put it on when leaving school. It is still necessary to point out that clothes pegs set too near together facilitate the transfer of vermin from one garment to another. There ought to be as much supervision on the disposal of garments as on the disposal of books.

VENTILATION.

In the newer schools ample provision is made for cross ventilation generally. The difficulty in providing efficient ventilation is bound up with the difficulty in keeping the room warm in wintry weather. If ventilation is to be free and efficient a greater heating area in the way of hot water radiators will be required. Frequently no radiators at all are found and the ventilation therefore suffers in the efforts to keep the room at a reasonable temperature. In such cases the intermittent scheme of ventilation is better than a continuous flow of cold air into an inadequately heated room. In exceptional circumstances therefore, in cold wintry weather the windows should be opened wide for a few seconds at half hourly intervals and during this short period vigorous arm exercises should be given to the children. The closest attention should be paid in the case of heating apparatus to the situation of the furnace, so that fumes from this may have no chance of entering the school. It may not be out of place to mention that a deadly poisonous gas is given off from some stoves and furnaces.

LAVATORY ACCOMMODATION.

Wash basins are generally provided, but seem to be regarded by the children as receptacles for all the rubbish that can be put into them, with the result that the outlets are frequently found to be blocked. It is still necessary to urge the provision of more soap and towels and the practical demonstration of their correct use.

EQUIPMENT.

The substitution of desks by tables and chairs takes place when ever practicable. This is of considerable assistance to the caretaker, whilst being more comfortable for the children.

ARRANGEMENTS FOR WARMING FOOD AND SERVICE OF MEALS IN SCHOOLS.

Nearly all schools have now facilities for making hot drinks and many of them have also facilities for warming any food which may be brought for the mid-day meal.

MEDICAL INSPECTION.

ARRANGEMENTS FOR AND METHODS OF INSPECTION.

The following Table shows the number of Schools, Departments, &c., on December 31st, 1928 :—

No. of Council Schools	...	...	...	...	...	141
No. of Non-provided Schools	...	...	...	...	...	541
Total number of Schools	...	...	...	...	—	682
No. of Departments in Council Schools	...	...	...	...	...	213
No. of Departments in Non-provided Schools	...	...	...	...	...	714
Total number of Departments	...	...	...	...	—	927
Accommodation	...	...	...	...	...	195,840
Average number on Roll	...	...	...	...	...	131,929
Average Attendance	...	...	...	...	...	115,831
No. of Teachers (excluding Pupil Teachers and Student Teachers)	...	...	...	...	...	4,186

During the year under review the Administrative County was divided into 17 districts, each of which was in charge of an Assistant County Medical Officer, assisted by two or three Nurses and Health Visitors, who prepare the children for examination, inspect their persons and clothing for uncleanness and vermin, and follow up the cases recommended for treatment. At the routine inspections, which take place, as a rule, annually, the children examined are those entering school life, those about to leave, and those in the middle of their school career. These are the routine groups. In addition, there are inspected special cases, viz., those in whom some defect is suspected by Medical Officer, Nurse, Teacher, School Attendance Officer, or parent; and the group of re-examinations, viz., those whom the Medical Officer has decided at the previous examination to keep under observation, whether or not they have been recommended for treatment. This latter group is also seen at other visits than the routine visits, as frequently as opportunity permits.

It is manifestly impossible to make an exhaustive examination of a child on the school premises. Children suspected to be suffering from defects unascertainable in a school classroom are referred, where possible, to the School Clinic for further examination. If no Clinic is available, they are referred to their own doctor, with an indication to the latter of the point requiring investigation. Such cases, however, are not numerous, and the usual defects found in children can be diagnosed on the school premises.

The cards, on which defects are recorded, are kept on the school premises in places of security, and not at the Central Offices. The Medical Officers are assisted by women clerks who, when not engaged at School Clinics or Child Welfare Centres or similar work, keep all the records in order and compile summaries for use at the Central Offices. In addition to the work done at the annual routine inspection the Nurses visit the schools four times a year, or as often as possible, for the purpose of examining all the children with regard to cleanliness and for following up cases recommended for treatment.

The following Tables show the work done in the Elementary Schools by the Assistant Medical Officers and Nurses during 1928 :—

ROUTINE MEDICAL INSPECTION OF ELEMENTARY SCHOOLS.

No. of Schools visited	...	...	...	...	630
No. of Departments visited	...	...	...	...	880
No. of "Entrants" examined—					
Boys	...	...	...	9,007	
Girls	...	...	...	8,805	
				————	17,812
No. of "Intermediates" examined—					
Boys	...	...	...	6,166	
Girls	...	...	...	6,146	
				————	12,312
No. of "Leavers" examined—					
Boys	...	...	...	6,046	
Girls	...	...	...	6,013	
				————	12,059
No. of "Specials" examined—					
Boys	...	...	...	6,549	
Girls	...	...	...	6,420	
				————	12,969
No. of Children examined ("Entrants," "Intermediates," "Leavers," and "Specials")—					
Boys	...	...	...	27,768	
Girls	...	...	...	27,384	
				————	55,152
No. of Children re-examined...	...	...	...	...	16,006
No. of Parents interviewed as part of the systematic inspection	...	...	...	...	6,081
No. of Homes visited	...	...	...	...	386

The above table refers only to the work done at routine medical inspections.

The following table shows the work done in Elementary Schools by the Medical Officers at visits other than routine visits :—

No. of Schools re-visited	...	...	...	...	672
No. of re-visits paid to schools	...	...	...	...	948
No. of children examined at re-visits	...	...	...	...	41,454
No. of children recommended for specific medical treatment	...	...	...	...	3,880
No. of parents interviewed at school	...	...	...	...	1,138
No. of homes visited	...	...	...	...	511

The following table shows the work done in Elementary Schools by the Nurses ; it does not include visits or work done when they were accompanying the Medical Officers :—

No. of visits paid to schools	...	...	...	...	4,092
No. of children examined	...	...	...	...	172,553
No. of children verminous	...	...	...	...	5,525
No. of children with ringworm	...	...	...	...	564
No. of parents interviewed at school	...	...	...	...	1,320
No. of homes visited	...	...	...	...	16,055

The Register of Defective Children—cripples, blind, deaf and dumb, epileptics and mental defectives—has been kept up-to-date, and the Table will be found at the end of this Report.

The Teachers, Heads and Assistants, are extremely helpful in the work of Medical Inspection, and it may now be said that there are few instances in the whole County where the teachers do not take a great interest in the work and render valuable assistance by noting defects and giving what help they can to remedy them.

FINDINGS OF MEDICAL INSPECTION.

The following tables show the findings of the routine medical inspection, *i.e.* the formal and systematic inspection made annually of all the age groups prescribed by the Board of Education.

The first table shows in percentages the results of the inspection of these routine groups only :—

		ENTRANTS. (Ages 3, 4, and 5.)		INTER- MEDIATES. (Age 8.)		LEAVERS. (Ages 12, 13, and 14.)	
		Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
No. Examined		9007	8805	6166	6146	6046	6013
Mental Condition.	Children having Defects.....	55.4	56.3	57.7	59.8	48.0	54.6
	Dull and Backward T	...	...	0.02	...	...	...
	O	0.8	0.5	1.5	0.7	1.0	0.6
	Feeble-minded T	...	...	...	...	...	...
	O	0.07	0.02	0.2	0.1	0.2	0.08
	Imbeciles T	...	...	...	...	...	...
	O	...	0.02	...	0.02	0.02	0.02
	Idiots T	...	...	...	...	...	...
	O	...	...	...	...	0.02	...
	Malnutrition T	0.08	0.05	0.1	0.2	0.1	0.1
Unclean- liness.	O	2.1	1.6	2.6	2.3	1.8	1.7
	Head T	0.3	2.4	0.4	2.6	0.2	1.3
	O	0.9	7.5	1.2	10.5	0.6	7.5
	Body T	0.3	0.3	0.2	0.2	0.1	0.1
	O	0.6	0.7	0.8	0.7	0.8	0.5
	Ring- worm.	Head T	0.2	0.1	0.1	0.07	0.08
		O	0.02	0.1	...	0.05	0.05
	Body T	0.06	0.03	0.06	0.1	0.07	0.05
		O	0.01	0.01	0.02	...	0.05
	Scabies T	0.08	0.08	0.03	0.03	0.08	...
Skin.	O	...	0.01	...	...	...	...
	Impetigo T	1.2	1.3	1.2	0.7	0.6	0.4
	O	0.5	0.3	0.2	0.2	0.1	0.07
	Other Diseases T	0.5	0.7	0.5	0.5	0.3	0.5
	(Non-Tubercular) O	0.6	0.6	0.5	0.5	0.4	0.7
	Defective Vision SP	0.5	0.6	5.4	6.7	6.2	7.1
	O	0.6	0.8	6.5	7.4	6.6	7.4
	Squint T	1.1	1.2	0.4	0.4	0.3	0.3
	O	1.1	1.4	0.7	1.0	0.8	0.9
	Conjunctivitis T	0.2	0.2	0.2	0.4	0.2	0.2
Eye Diseases.	O	0.3	0.3	0.3	0.4	0.2	0.4
	Blepharitis T	0.8	0.8	0.8	0.9	0.5	0.8
	O	0.6	0.5	0.4	0.6	0.3	0.7
	Keratitis T	...	0.01	...	0.02	...	0.02
	O	0.01	0.01	...	...	0.02	0.02
	Corneal Opacities T	0.01	0.03	0.03	0.02	0.02	0.03
	O	0.03	0.07	0.08	0.01	0.05	0.1
	Corneal Ulcer T	0.03	0.02	0.03	...	0.03	...
	O	0.01	0.01	0.02	...	...	...
	Defective Hearing..... T	0.2	0.2	0.7	0.3	0.3	0.4
Ear Diseases.	O	0.3	0.3	1.0	0.7	0.7	0.6
	Otitis Media T	0.8	0.6	0.8	0.5	0.9	0.9
	O	0.1	0.09	0.1	0.2	0.2	0.2
	Other Ear Diseases T	0.3	0.3	0.4	0.4	0.3	0.3
	O	0.3	0.5	0.3	0.2	0.3	0.2

			ENTRANTS. (Ages 3, 4, and 5.)		INTER- MEDIATES. (Age 8.)		LEAVERS. (Ages 12, 13, and 14.)	
			Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
Nose and Throat.	Enlarged Tonsils	T	1.6	1.6	2.0	1.9	1.4	2.0
		O	10.6	11.4	8.9	8.9	8.3	9.5
	Adenoids.....	T	0.2	0.4	0.3	0.3	0.1	0.2
		O	1.4	1.3	1.2	0.7	0.6	0.5
	Enlarged Tonsils and Adenoids..	T	1.5	1.3	1.1	1.3	0.6	0.7
		O	2.3	2.5	1.7	1.8	1.1	0.7
	Enlarged Cervical Glands	T	0.03	0.07	0.2	0.07	0.05	0.03
	(Non-Tubercular)	O	11.2	10.4	8.7	7.6	4.9	4.1
	Defective Speech	T	0.09	0.2	0.02	0.08	0.1	0.05
		O	0.9	0.4	1.7	0.2	0.4	0.2
Heart and Circulation.	Teeth.							
	Four or more Carious	T	11.2	10.3	12.1	12.7	9.2	9.6
		O	11.7	11.7	10.2	10.3	4.1	3.7
	Sepsis	T	0.7	0.9	0.5	0.5	0.3	0.3
		O	0.2	0.2	0.02	0.05	0.1	0.3
	Organic	T	0.01	0.06	...	0.03	0.07	0.1
		O	0.4	0.4	0.6	0.7	0.7	0.9
	Functional	T	0.01	...	...	...	...	0.02
		O	1.9	1.7	2.2	2.2	2.1	2.8
	Anæmia	T	0.1	0.06	0.1	0.05	0.1	0.1
		O	0.8	0.6	0.6	0.5	0.3	0.5
	Bronchitis	T	0.6	0.5	0.4	0.3	0.2	0.2
Lungs.		O	3.4	2.9	2.4	1.5	1.0	0.7
	Other Non-Tubercular Diseases..	T	0.02	0.05	0.03	0.02	0.05	0.08
		O	0.7	0.5	1.0	0.5	0.6	0.3
	Pul- monary.	Definite	T	...	...	...	0.02	...
		O	...	...	...	...	0.02	0.02
	Suspected	T	0.02	0.02	0.02	...	0.02	0.08
		O	0.03	0.06	0.02	0.03	0.07	0.02
	Glands.....	T	0.04	0.06	0.02	0.03	0.03	0.03
		O	0.08	0.07	0.06	0.07	0.1	0.02
	Non- Pulmonary.	Spine	T	...	0.02	...	...	...
		O	...	0.01	0.03	...	0.02	0.02
	Hip	T	...	...	0.02	...	0.02	0.02
		O	...	0.01	...	0.02	0.02	...
	Other Bones and Joints	T	...	...	0.02	...	...	...
		O	0.04	0.03	0.02	...	0.02	0.02
Tuberculosis.	Skin	T	0.03	0.02	0.02	...	0.03	0.05
		O	0.03	0.01	0.02	...	0.02	0.02
	Epilepsy	T	...	...	0.02	...	0.03	...
		O	0.02	0.03	0.1	0.08	0.07	0.02
	Chorea.....	T	...	0.03	...	...	...	...
		O	0.08	0.02	0.06	0.07	...	0.05
	Infantile Paralysis.....	T	0.1	0.08	0.02	0.03	0.02	0.02
		O	0.08	0.07	0.03	0.05	0.2	0.02
	Rickets	T	0.2	0.1	0.08	0.05	...	...
		O	1.3	1.0	0.4	0.3	0.3	0.2
	Spinal Curvature	T	0.02	0.05	0.06	0.1	0.1	0.2
		O	0.1	0.1	0.3	0.3	0.3	0.4
Deform- ities.	Other Forms	T	0.4	0.3	0.3	0.3	0.4	0.6
		O	1.8	1.5	1.0	1.0	1.5	1.5
	Other Diseases or Defects	T	0.8	0.5	0.7	0.6	1.0	1.4
		O	1.4	1.6	1.4	1.9	3.0	4.8

In addition, there are also carefully examined a group of children who are known as "Specials." These children do not fall within one of the prescribed age groups, but are specially presented, as possibly having defects, by teachers, school attendance officers, parents, &c, or are picked out by the medical officer or nurse in a general inspection of the school. The number of "Specials" examined was 12,969.

The following table shows the results of the examination of the "Specials" group in 1928 :—

SPECIAL CASES.

		Boys.	Girls.			Boys.	Girls.					
No. Examined		6549	6420									
Children having Defects.....		4005	4245									
Mental Condition.	{	Dull and Backward	T	...	1	Nose and Throat.	Enlarged Tonsils	T	104	126		
			O	132	95			O	109	451		
		Feeble-minded	T	...	...			T	29	27
			O	34	26			O	56	59		
		Imbeciles	T	...	...		Enlarged Tonsils and Adenoids..	T	146	137
			O	7	4			O	212	201		
Uncleanliness.	{	Idiots	T	...	...	Teeth.	Enlarged Cervical Glands	T	5	5
			O	...	1			O	309	267		
		Malnutrition	T	5	6		Defective Speech	T	4	1		
			O	324	352			O	49	23		
		Head	T	30	115		Four or more Carious	T	454	392		
			O	96	634			O	581	617		
Skin.	{	Body	T	4	3	Lungs.	Sepsis	T	25	27		
			O	26	26			O	3	6		
		Ring-worm.	Head	T	23		19	Organic		T	5	...
			Body	T	1		5			O	68	60
			O	1	2		Functional	T	1	2		
		Scabies	T	4	3			O	264	196		
Eye Diseases.	{	Impetigo	T	76	53	Tuberculosis.	Anaemia	T	10	6		
			O	38	24			O	76	68		
		Other Diseases (Non-Tubercular)	T	45	38		Bronchitis	T	23	15		
			O	35	44			O	134	76		
		Defective Vision	SP	407	517		Other Non-Tubercular Diseases.	T	2	1		
			O	375	419			O	75	47		
Ear Diseases.	{	Squint	T	69	53	Nervous System.	Pulmonary.	Definite	T	1	...	
			O	71	85				O	
		Conjunctivitis	T	13	18			Suspected	T	3	4	
			O	22	18			O	12	4		
		Blepharitis	T	54	49		Non-Pulmonary.	Glands.....	T	3	3	
			O	41	47				O	5	7	
Keratitis	T	5	3	Spine	T	...		...	
Deformities.	{		O	1	...		O	1	...			
		Corneal Opacities	T	3	4	Hip	T	...	...	
			O	13	8		O	3	...			
		Corneal Ulcer	T	3	4	Other Bones and Joints	T	...	1			
			O	3	2		O	3	...			
		Defective Hearing.....	T	46	34	Skin	T	...	1			
Deformities.	{		O	56	43		O	...	...	
		Otitis Media	T	53	52	Epilepsy		T	3	...		
			O	29	10			O	7	6		
		Other Ear Diseases	T	7	16			T	2	2		
			O	14	13		O	7	12			
		Deformities.	{					Chorea.....		T	10	8
							T		10	8		
							O		23	8		
						Infantile Paralysis.....		T	7	4		
								O	10	8		
								T	10	8		
Deformities.	{					Rickets		T	10	8		
								O	23	8		
								T	12	9		
						Spinal Curvature		T	12	9		
								O	13	20		
							Other Forms	T	25	35		
Deformities.	{					Other Diseases or Defects		O	106	88		
								T	61	79		
								O	166	189		

In addition to the children who were examined at routine inspections, and whose defects are classified in the preceding tables, the Medical Officers re-examined 16,006 children who had been found defective at previous inspections. They also paid 948 re-visits to schools and examined 41,454 children ; of these, 3,880 were recommended for specific medical treatment. The classification of these children into age groups or defect categories would serve no useful purpose, and has, therefore, not been made.

REVIEW OF FINDINGS

The Routine Inspection of School Children, viz.:—examination of Entrants, Intermediates and Leavers, was resumed in 1920, and, with some minor alterations, has continued in the same form since that time.

A comparison, therefore, of the findings of 1928 with those of previous years has been made in the case of certain diseases and defects in order to see whether, and to what extent, changes are taking place in the incidence of these defects.

In the following summary of certain of the defects cases for treatment and observation from Entrants, Intermediates and Leavers (the Routines), have been added together and their percentages have been compared with those of previous years.

MALNUTRITION.

The percentages for the years 1920-1928 are amongst Routine cases only, and are those of the grosser degrees of under-nourishment.

Year.					%
1920	...	...	...	...	2.28
1921	...	...	...	...	1.36
1922	...	...	...	...	1.81
1923	...	...	...	...	2.0
1924	...	...	...	...	2.46
1925	...	...	...	...	1.97
1926	...	...	...	...	1.84
1927	...	...	...	...	2.16
					1.93
					Average for 8 years.
1928	...	...	...	...	2.12

The percentage for 1928 is not significantly different from the average of the previous 8 years. An inspection of the accompanying graph shows a distinct peak in 1924 with two minima in the years 1921 and 1926. It may be only a coincidence that in both of these two years school feeding took place on a somewhat extensive scale.

GRAPH I MALNUTRITION - ROUTINE CASES



During the year a special enquiry was made in certain districts by seven of the Assistant County Medical Officers. Six of these districts were colliery districts, and a seventh, containing mostly factory workers, was examined as a control. In the six colliery districts 13,510 children were examined and of this number 190 or 1.4 per cent. were found to be suffering from markedly subnormal nutrition, whilst a further 1,463 or 10.8 per cent. were suffering from subnormal nutrition. In the control districts the respective percentages were 2.4 per cent. and 7.4 per cent. These figures are not strictly comparable with those of the Routine Inspections, but, however they are regarded, there can be no doubt of the existence of an undesirable number of

underfed or improperly fed children in the County. In the investigation referred to, little or no difference could be detected between the children of colliers and those of other classes of workers. The opinions of the Medical Officers showed that the defect in the feeding is not so much one of quantity as of quality of food. By quality of food is meant the properly adjusted balance of the articles of diet, *viz.*: suitable proportions of the proteins, fats, carbohydrates, mineral salts, vitamins, etc., which are necessary for the building up and maintenance of the bodily and mental functions. The main defect in the feeding is the giving of too much carbohydrate (bread and jam, potatoes, etc.) at the expense of foods containing more protein, fat and vitamins. Other causes of malnutrition, of course, exist such as :—

- (1) Bad heredity and environment, including parental neglect.
- (2) Disease, past or present, interfering with the powers of digestion and assimilation.
- (3) Bad hygiene and habits, such as loss of sleep.

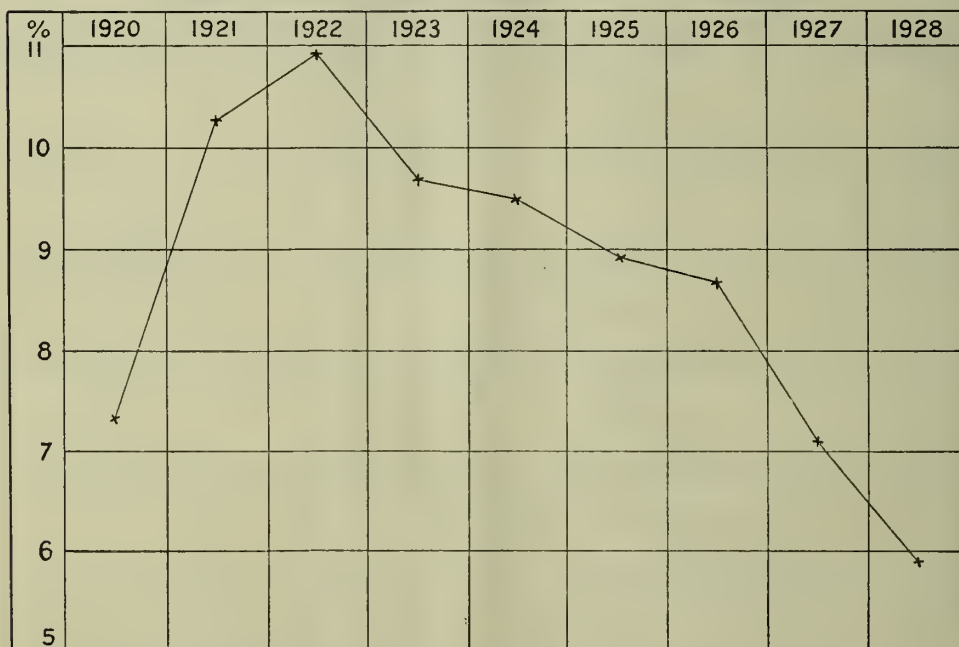
Reasons of convenience and economy determine to a large extent the excessive carbohydrate consumption of the school children, for protein-containing foods and fats are relatively expensive.

There is one food which contains nearly all the essentials of a perfect diet, namely milk, and this food has been recommended by the Medical Officers as supplying the necessary supplement to the bulky, but imperfectly balanced meal so frequently given to the under-nourished.

UNCLEANLINESS.

Amongst Routine cases, *i.e.*, as noted by the Medical Staff at their Routine Inspections, the percentage of Unclean Heads has fallen to 5.85 per cent. as compared with an average of 9.34 per cent. for the previous 8 years. The graph shows a steady reduction of this form of neglect since the year 1922.

GRAPH 2 UNCLEAR HEADS - ROUTINE CASES



The situation as regards unclean bodies is more variable. During 1928 the percentage fell from a region of 1.15 per cent. for the three previous years, to 0.87 per cent., but this is no better than the percentages found in 1922 and 1923 and, although the numbers found, compared with Unclean Heads, are small, it would seem that this condition is not yet under control and that more vigorous measures are needed for further reduction of a defect which is uncomfortable for the possessors and unwelcome to the cleaner neighbours.

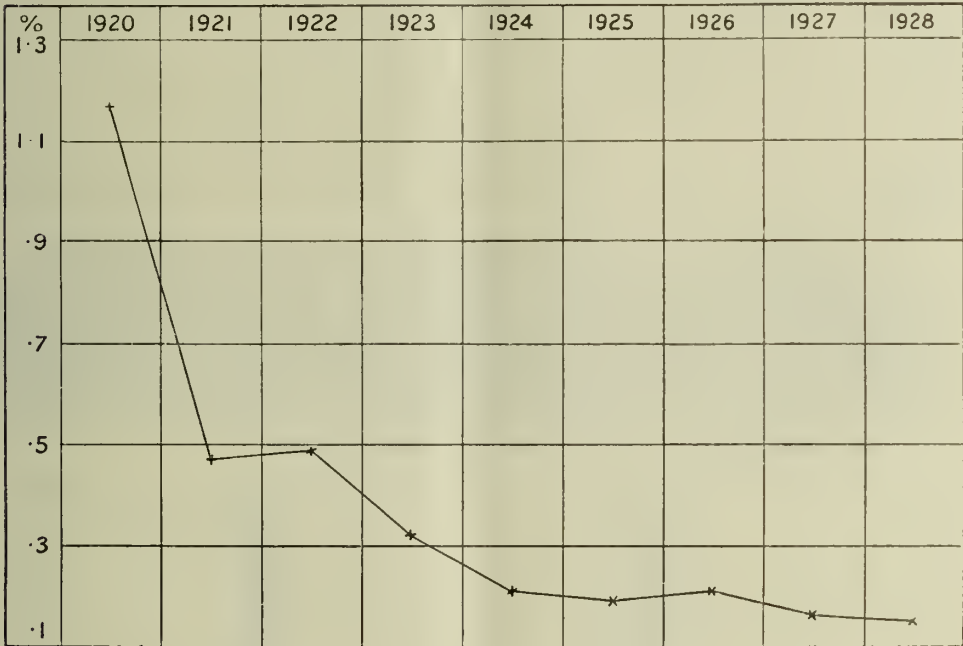
The percentages for Unclean Heads and Bodies are as follows :—

Year.				Heads.			Bodies.
1920	...	...	...	7.32	...	...	1.75
1921	...	...	...	10.29	...	...	1.55
1922	...	...	...	10.95	...	...	0.86
1923	...	...	...	9.7	...	...	0.84
1924	...	...	...	9.52	...	...	0.98
1925	...	...	...	8.93	...	...	1.15
1926	...	...	...	8.68	...	...	1.15
1927	...	...	...	7.06	...	...	1.15
1928	...	...	...	5.85	...	...	0.87

RINGWORM OF HEAD.

This again shows a slight diminution compared with the previous year and a general inspection of the chart attached shows that since 1920 the form of the curve follows roughly that known as a “die-away” curve, and it is not too sanguine, therefore, to hope that in a comparatively short time this puerile trouble will have reached the vanishing point. Ringworm of the head is treated by X-Rays, under arrangements made by the Committee, and, no doubt, the shortening of the period of treatment by this means has contributed to the fall in the incidence.

GRAPH 3 RINGWORM OF HEAD - ROUTINE CASES



RINGWORM OF THE BODY.

This does not show the same reduction as Ringworm of the Head. The parasite is of a different kind and is conveyed perhaps in other ways, so that the opportunities for infection, especially in rural areas, are always present.

The figures for both defects are given below.

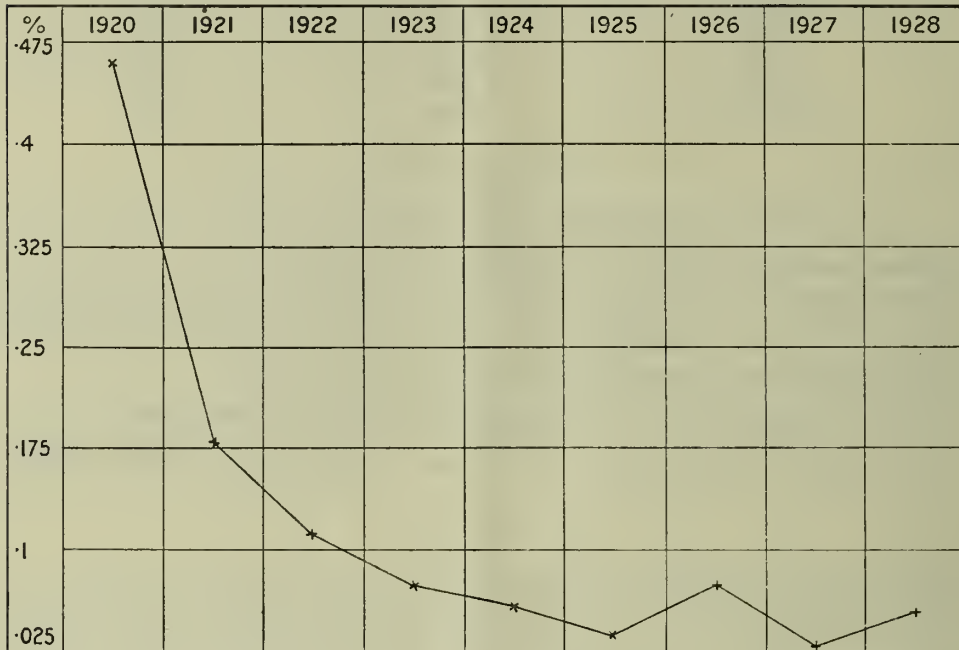
RINGWORM.							
Year.				Head.			Body.
1920	...	...	...	1.17	...	...	0.2
1921	...	...	...	0.47	...	...	0.097
1922	...	...	...	0.49	...	...	0.063
1923	...	...	...	0.32	...	...	0.121
1924	...	...	...	0.21	...	...	0.057
1925	...	...	...	0.19	...	...	0.102
1926	...	...	...	0.21	...	...	0.076
1927	...	...	...	0.16	...	...	0.079
1928	...	...	...	0.15	...	...	0.081

SCABIES.

An inspection of the graph for the incidence of Scabies shows that from 1920 to 1925 there was a considerable fall, in fact, all the appearances of a die-away curve are present.

GRAPH 4

SCABIES - ROUTINE CASES



The percentages, however, went up in 1926 and again in 1928, possibly due to the importation of fresh cases from other districts. As each case of importation of this parasitic disease generally gives rise to several others in intimate contact the percentage is apt to shoot up in certain years. There seems to be no doubt that if we were not thus invaded the disease would, in a short time, disappear completely. As it is there is a more or less stationary condition at or about the pre-war level.

The percentages for Routine cases in the last 9 years are :—

Year.					%
1920	...	...	...	...	0.46
1921	...	...	...	...	0.181
1922	...	...	...	...	0.11
1923	...	...	...	...	0.073
1924	...	...	...	...	0.057
1925	...	...	...	...	0.033
1926	...	...	...	...	0.073
1927	...	...	...	...	0.026
1928	...	...	...	...	0.057

IMPETIGO CONTAGIOSA.

An inspection of the graph for the last 9 years shows that there is no present tendency towards the disappearance of this disease.

GRAPH 5

IMPETIGO - ROUTINE CASES



Its treatment is troublesome and lengthy and there are, on this account only, frequent opportunities for contagion. These opportunities are increased by the dirty and careless habits of some of the victims. It is more common in boys than in girls and found more frequently in Elementary than in Secondary Schools. Neglected abrasions and scratches seem to be a fruitful source of origin of many cases, especially amongst boys, and the treatment of all trivial injuries at once is therefore necessary. When the disease has become established in any particular school, rigorous exclusion is the only known method of checking the incidence of the complaint.

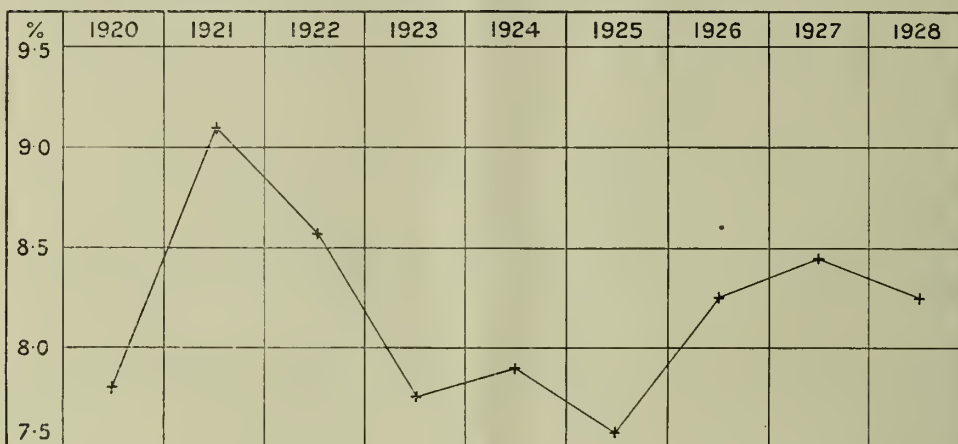
The percentages amongst all Routine cases since 1920 are :—

Year.					%
1920	...	...	...	...	1.33
1921	...	...	...	...	1.21
1922	...	...	...	...	1.32
1923	...	...	...	...	0.91
1924	...	...	...	...	0.94
1925	...	...	...	...	1.18
1926	...	...	...	...	0.89
1927	...	...	...	...	1.03
1928	...	...	...	...	1.21

DEFECTIVE VISION.

An average of 8.24 per cent. for 1928 is the experience for all Entrants, Intermediates and Leavers as compared with an average of 8.26 per cent. for the previous 8 years. The incidence varies with age and sex and the subject is dealt with later in this Report by Dr. G. G. Wray, Assistant County Medical Officer.

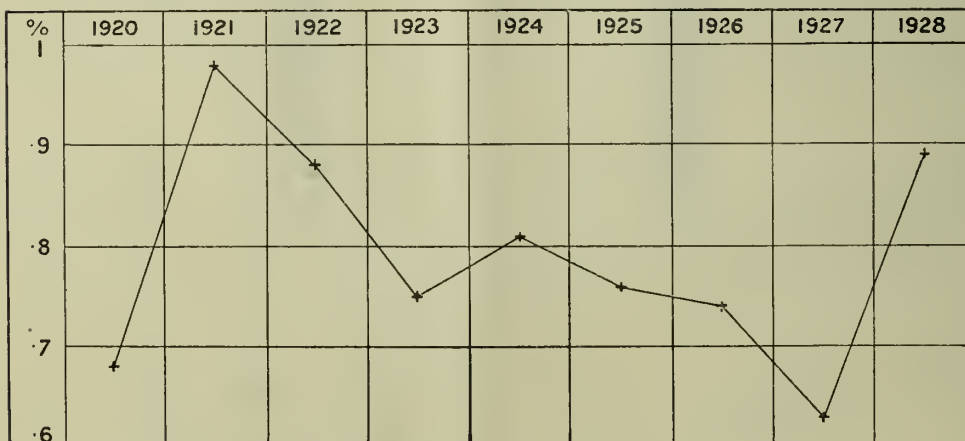
GRAPH 6 DEFECTIVE VISION - ROUTINE CASES



OTITIS MEDIA.

This distressing and dangerous complaint, which had shown up to 1927 a tendency to diminish since 1921, once more made a small percentage increase in 1928, the general level being 0·89 per cent. as against 0·8 per cent. for the previous eight years. The condition frequently begins in infancy and, when neglected, becomes chronic. It is often associated with infectious diseases such as Measles and Scarlet Fever and always with some infection of the nose and throat. Its prevention, therefore, is no simple matter and its cure is still difficult.

GRAPH 7 OTITIS MEDIA - ROUTINE CASES



OTITIS MEDIA—continued.

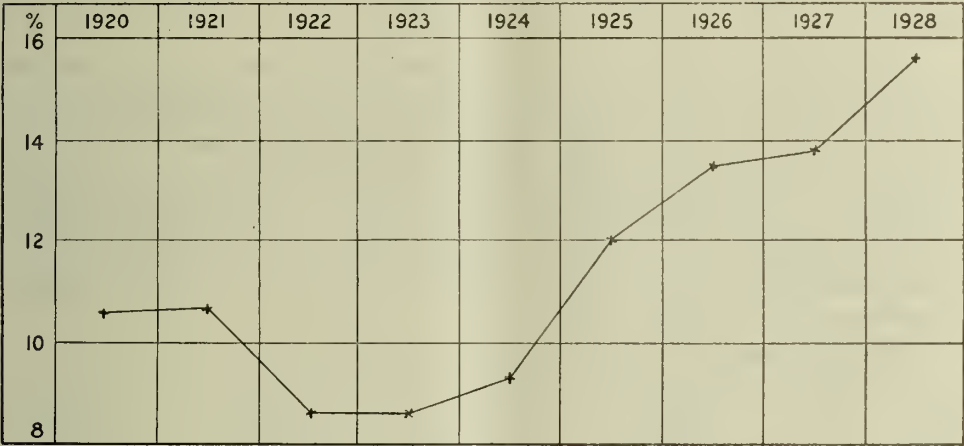
The percentages of Routine cases since 1920 are :—

Year.					%
1920	...	...	...	...	0·68
1921	...	...	...	...	0·98
1922	...	...	...	...	0·88
1923	...	...	...	...	0·75
1924	...	...	...	...	0·81
1925	...	...	...	...	0·76
1926	...	...	...	...	0·74
1927	...	...	...	...	0·63
1928	...	...	...	...	0·89

TONSILS AND ADENOIDS.

Cases for treatment and observation, whether for Tonsils or Adenoids or both, have been added together for all Routine cases, and the result shows, as displayed on the graph, a definite rise in every year since 1923. This rise is mostly accounted for by an increase in the cases noted for observation.

GRAPH 8 TONSILS & ADENOIDS - ROUTINE CASES



Of late years the enhanced facilities for treatment, provided by the Committee, have, no doubt, contributed to a greater desire on the part of the parents to avail themselves of those opportunities for operative treatment which have been granted, and it is now no uncommon event for a request for operation to be made by the parent in the case of a child who has not been previously inspected. The rise in the figures may denote an increase of attention to a fruitful source of ill health rather than an actual increase in the condition itself.

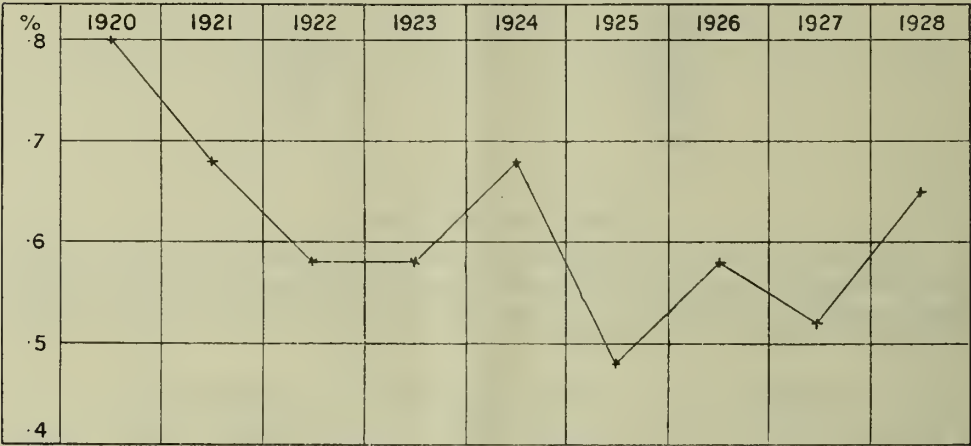
The percentages are as follows :—

Year.					%
1920	...	...	...	...	10·61
1921	...	...	...	...	10·74
1922	...	...	...	...	8·66
1923	...	...	...	...	8·66
1924	...	...	...	...	9·39
1925	...	...	...	...	12·02
1926	...	...	...	...	13·56
1927	...	...	...	...	13·83
1928	...	...	...	...	15·67

ORGANIC HEART DISEASE.

This subject is dealt with later in this Report by Dr. A. C. Crawford, Assistant County Medical Officer. For the last 8 years, as shown on the chart, there has been little variation in the occurrence of this disease amongst school children.

GRAPH 9 ORGANIC HEART DISEASE- ROUTINE CASES



Although the records only show a small amount of disease, 0.5—0.7 per cent., the severer cases are not usually seen in school and the true percentage amongst children is therefore higher than that shown in the records. Little can be done to prevent the congenital cases of Heart Disease, but the acquired cases are due to acute Rheumatism, in one or other of its forms, and the attention which is now being paid to septic teeth and tonsils should have, in the long run, a beneficial influence on the occurrence of organic Heart Disease. In fact, many of our Public Health activities such as the disposal of sewage, the provision of dry houses and schools, etc., have a direct bearing on this problem. For any further improvement an increased attention to personal hygiene is highly desirable.

The percentages for 9 years are :—

Year.					%
1920	...	...	...	...	0.8
1921	...	...	...	...	0.68
1922	...	...	...	...	0.58
1923	...	...	...	...	0.58
1924	...	...	...	...	0.68
1925	...	...	...	...	0.48
1926	...	...	...	...	0.58
1927	...	...	...	...	0.52
1928	...	...	...	...	0.65

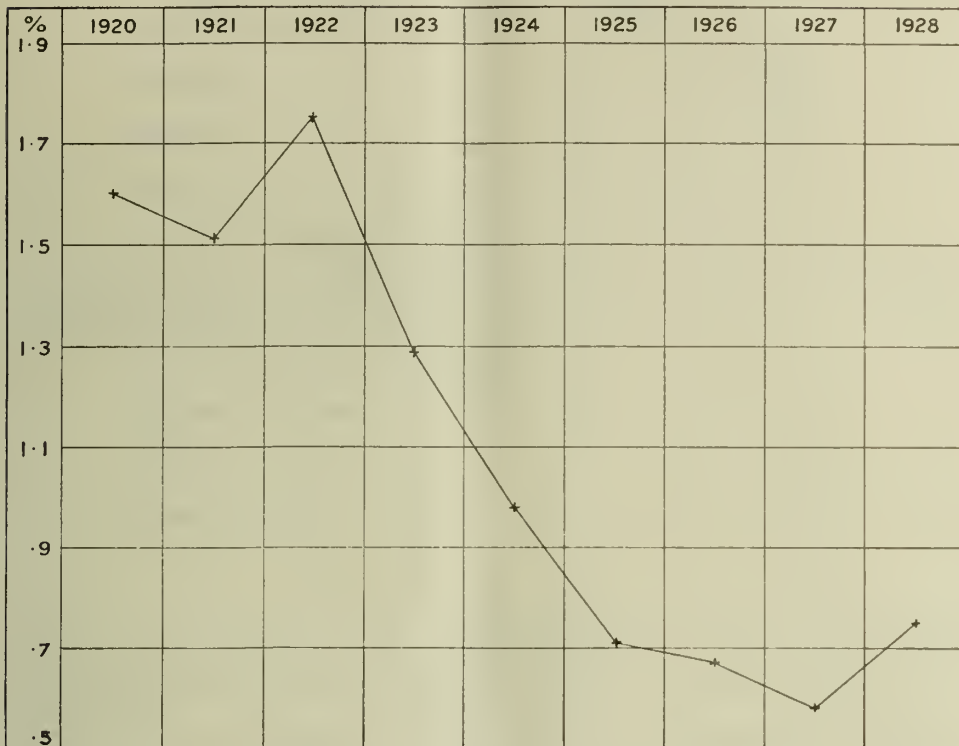
RICKETS.

Only the grosser forms of Rickets are noted in the Returns.

On looking at the chart a distinct fall is seen from 1922 onwards, with a slight rise in 1928.

GRAPH 10

RICKETS - ROUTINE CASES



As the cases of Rickets seen in schools are mostly manifestations of earlier disease, and the association of Rickets and malnutrition has been commented on in a previous Report, it is quite possible, supposing that malnutrition in school children coincides with malnutrition in the other children not yet at school, that the peak of malnutrition noted for 1924 is somehow related to the rise in Rickets for 1928. The relatively high figures for Rickets in 1920, 1921 and 1922 may also be related to the malnutrition of the later years of the war but the number of years is too few for any scientific investigation to be based on this number alone.

The percentages for 9 years are :—

Year.					%
1920	...	...	...	...	1.6
1921	...	...	...	...	1.51
1922	...	...	...	...	1.75
1923	...	...	...	...	1.29
1924	...	...	...	...	0.98
1925	...	...	...	...	0.71
1926	...	...	...	...	0.67
1927	...	...	...	...	0.58
1928	...	...	...	...	0.75

VISUAL ACUITY.

The Visual Acuity of all “ Intermediates ” *i.e.*, children aged eight years, and all “ Leavers ” *i.e.*, children aged 12, 13 and 14 years, is tested by means of the Snellen test types and the following table summarises the results of these tests. :—

	BOYS.		GIRLS.	
	Inter- mediates.	Leavers.	Inter- mediates.	Leavers.
No. Examined	6,144	6,046	6,125	6,008
6	R.	83·3	83·7	81·1
	L.	82·3	82·2	79·2
9	R.	7·9	6·4	8·6
	L.	8·6	7·7	9·6
12	R.	2·8	3·0	3·8
	L.	3·1	3·5	3·9
18	R.	2·5	2·7	3·1
	L.	2·7	2·5	3·3
24	R.	1·3	1·6	1·3
	L.	1·3	1·9	1·6
36	R.	1·1	1·2	1·0
	L.	1·0	1·3	1·3
60	R.	0·6	0·8	0·7
	L.	0·5	0·5	0·7
0	R.	0·5	0·5	0·4
	L.	0·5	0·4	0·4

DENTAL DEFECTS.

As dentists are now inspecting children at a higher age it is perhaps more important to review their figures than those of the Medical Officers.

Of the children inspected by the dentists 74·6 per cent. were found to require treatment.

The subject of Oral Sepsis is dealt with later in this Report by Dr. McAsh, one of the dentists on the staff.

CRIPPLING DEFECTS.

The following table shows the incidence of the principal crippling diseases among the children who were examined in the routine age groups :—

	ENTRANTS.		INTERMEDIATES		LEAVERS.	
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
Tuberculosis of Bones and Joints ...	0·04	0·08	0·08	0·02	0·07	0·05
Infantile Paralysis	0·2	0·1	0·05	0·08	0·2	0·03
Rickets	1·5	1·1	0·5	0·3	0·3	0·2
Spinal Curvature and other Dcformities	2·3	1·9	1·6	1·8	2·3	2·7

The following table shows the position amongst the group of “Specials” :—

	Boys.	Girls.
No. Examined	6,549	6,420
Tuberculosis of Bones and Joints ...	7	1
Infantile Paralysis	17	12
Rickets	33	16
Spinal Curvature and other Deformities	156	152

The total number of children belonging either to the routine age groups or to the class of “Specials” who were found to be suffering from one of the conditions which produce crippling, is shown below :—

Tuberculosis of Bones and Joints	32
Infantile Paralysis	83
Rickets	364
Spinal Curvature	194
Other Deformities	1016
	<u>1688</u>

It is to be noted that the above table refers to the conditions which produce crippling, and not necessarily to actual crippling; many of the conditions noted require observation only, and not active treatment.

The ascertainment of all the crippled children in the Administrative County is being actively pursued. At the end of 1928 the number of crippled children of Elementary School age who had been definitely entered on the new register of cripples was as follows :—

	Boys.	Girls.	Total.
Active non-pulmonary tuberculosis, chiefly of bones and joints	84	59	143
All other forms of crippling	1000	863	1,863

These figures give a very imperfect idea of the amount of crippling conditions which have to be treated under the Authority’s Cripple Scheme; they take no account of the cripples under school age, and yet the incidence of the principal causes of crippling—tuberculosis, rickets, and infantile paralysis—is largely prior to school age and occurs in the first five years of life.

INFECTIOUS DISEASE.

Of administrative procedures for the prevention of infectious disease the most important are :—

- 1.—The exclusion of children suffering from, or showing symptoms suggestive of, infectious disease, or who may, it is feared, develop disease after exposure to infection;
- 2.—The closure of schools or of departments of schools.

During 1928 it was found necessary to close 48 schools on account of the prevalence of infectious disease. Every endeavour has again been made by the Assistant County Medical Officers to work in close co-operation with the local Medical Officers of Health whenever the closure of a school or department was in question.

The following tables show the number of schools which were closed during the year and the causes of closure :—

*No. of Schools Closed during 1928 by the Sanitary Authority
(Article 57 of the Code).*

Measles	...	...	...	...	...	...	25
Scarlet Fever	...	...	...	...	...	...	4
Whooping Cough	...	...	...	...	...	...	6
Diphtheria	...	...	...	...	...	...	1
Chicken-pox and Mumps...	...	...	...	...	...	...	1
Measles and Whooping Cough	...	...	...	...	...	...	1
Scarlet Fever, Measles and Diphtheria	...	...	...	...	...	...	1
							<hr/> 39 <hr/>

*No. of Schools closed during 1928 by the School Medical Officer
(Article 45 (b) of the Code).*

Scarlet Fever	...	...	...	...	...	...	3
Diphtheria	...	...	...	...	...	...	1
Whooping Cough	...	...	...	...	...	...	5
							<hr/> 9 <hr/>

There are two Authorities concerned in the closure of schools for Infectious Disease. The type of epidemic and the severity of the disease are known to the Local Medical Officer of Health, and this knowledge guides him very largely in determining whether a school shall be closed at the outset, or shortly afterwards. The Local Medical Officer of Health is concerned not with the average attendance at school, but solely with the control of the spread of Infectious Disease.

The School Medical Officer may close the school under Article 45(b) of the Code for medical reasons only. Such medical reasons would include not only the control of Infectious Disease, but conditions affecting the health of the children in other ways, such as bad lighting, bad ventilation, or the occurrence of any defect in the heating apparatus, all of which might be prejudicial to the health of the children. In practice, the two officers are concerned with the same thing, *i.e.*, the spread of Infectious Disease. The closure of schools for any other reason is seldom required.

Neither officer should take into account the closure of schools where the attendance has already fallen by a large amount through the occurrence of Infectious Disease, for the simple reason that the damage has already been done. In such cases, however, the School Medical Officer is empowered to give certificates to any school where the attendance, on account of the occurrence of Infectious Disease, has fallen below 60 per cent. of the number of children on the Register.

The number of such certificates given during 1928 was 276.

EXCLUSIONS FROM SCHOOL

Article 53 (b) of the Code provides for the exclusion of individual children from school (1) on the ground that their exclusion is desirable to prevent the spread of disease, or (2) on the ground that their uncleanly or verminous condition is detrimental to the other scholars, or (3) on the ground that, owing to their state of health or their physical or mental defects, they are incapable of receiving proper benefit from the instruction in the school.

The exclusion of individual children, as distinct from closure of the whole school, is made by the Committee's own staff.

The exclusion by the Assistant County Medical Officers and Nurses is made on a special form in triplicate. One copy is sent to the Central Office for the approval and counter-signature of the School Medical Officer ; another is left in the school as authorisation for the Head Teacher and School Attendance Officer ; and the third is retained by the Medical Officer or Nurse as a record. The exclusions are made for a specified period, and the children are re-examined at the end of the period, and either re-admitted as fit for school or excluded for such further period as may be necessary.

In the following table the number of children excluded under Article 53 (b) and the causes of exclusion are shown :—

Uncleanliness.		Scabies.	Ring-worm.	Impetigo.	Scarlet Fever.	Measles	Mumps.	Diphtheria.	Chicken Pox.	Phthisis	Bronchitis.	Whooping Cough.	Other Diseases	Total.
Head.	Body.													
283	2	123	159	486	45	31	93	1	179	6	235	56	1916	3615

FOLLOWING-UP.

This was fully described in the Annual Report for 1925.

During the year the Nurses as School Nurses visited 16,055 homes, and also made 172,553 examinations of school children in school, paying 4,092 visits to the schools, in addition to the visits paid to, and the work done in, the schools when they assisted the medical officers at routine inspections. As Health Visitors they paid 87,171 visits to homes, 4,165 visits to expectant mothers, 516 visits to cases of ophthalmia neonatorum, and 1,416 visits on miscellaneous matters ; in the Child Welfare Centres they saw babies and young children 97,871 times, and expectant mothers 3,644 times.

MEDICAL TREATMENT.

The policy of asking parents to contribute according to their means is still followed. Cases are first of all referred to their own doctor, who treats the case if satisfactory arrangements can be made. If no treatment has been obtained within a month, the case is then referred to the Clinic, when such is available, or to Hospital, as the case may be. A nominal sum is asked for each attendance at the Clinic, but in necessitous cases no charge is made. The consent, in writing, of a parent or guardian is obtained before treatment of any kind is given.

Treatment continues to expand. The development of Medical Treatment has progressed still further, and during the year additional Clinics have been opened at Audenshaw and Padiham for the treatment of minor ailments, defective eyesight, and teeth defects. Arrangements have also been made with the Barton-upon-Irwell Park Hospital, the Fleetwood Hospital, the Ramsbottom Cottage Hospital, and the Widnes Accident Hospital, for the operative treatment of tonsils and adenoids.

In addition, certain children in subnormal health are receiving treatment by Artificial Light through clinics established at Atherton, Chorley, Horwich and Westhoughton.

The following is a list of the School Clinics now open for treatment, the kind of work which is undertaken in each being shown :—

Township.	Days and Times of Opening.		Nature of work undertaken.	Remarks.
Ashton-in-Makerfield	... Mon.	... 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Tues.	... 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments ... Orthopædic	... Surgeon attends second Tuesday in each month only.
	Wed.	... 10 a.m. to 12 noon 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Ophthalmic ... Dental	
	Thurs.	... 2 p.m. to 4 p.m.	... Minor Ailments...	Nurse only. Re-dressings.
	Fri.	... 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
Ashton-under-Lyne	Wed.	... 10 a.m. to 12 noon	... Orthopædic	... Surgeon attends third Wednesday in each month only.
	Fri.	... 10 a.m. to 12 noon	... Orthopædic	... Nurse only.
Atherton	... Mon.	... 2 p.m. to 4 p.m.	... Artificial light	
	Thurs.	... 9-45 a.m. to 12 noon		

Township.	Days and Times of Opening.		Nature of work undertaken.	Remarks.
Audenshaw	... Mon.	... 9-30 a.m. to 12 noon	... Minor ailments	
		9-30 a.m. to 12 noon	... Dental	
		2 p.m. to 4 p.m.		
	Tues.	... 10 a.m. to 12 noon	... Ophthalmic	... Open alternate weeks only.
		9-30 a.m. to 12 noon	... Dental	
		2 p.m. to 4 p.m.		
Burnley	Wed.	... 9-30 a.m. to 12 noon	... Dental	
		2 p.m. to 4 p.m.		
	Thurs.	... 9-30 a.m. to 12 noon	... Minor ailments	... Nurse only. Re-dressings.
		9-30 a.m. to 12 noon	... Dental	
		2 p.m. to 4 p.m.		
Chadderton	Fri.	... 9-30 a.m. to 12 noon	... Dental	
		2 p.m. to 4 p.m.		
	... Thurs.	... 2 p.m. to 4 p.m.	... Orthopædic	... Surgeon attends second Thursday in each month only.
Chorley	... Wed.	... 2 p.m. to 4 p.m.	... Orthopædic	... Surgeon attends fourth Wednesday in each month only.
	Fri.	... 2 p.m. to 4 p.m.	... Orthopædic	... Nurse only.
Dalton-in-Furness	... Mon.	... 2 p.m. to 3 p.m.	Boys ... Artificial light	
		3 p.m. to 4 p.m.	Girls	
	Tues.	... 9-30 a.m. to 12 noon	... Minor ailments... Nurse only.	Re-dressings.
		9-30 a.m. to 12 noon	... Dental	
		2 p.m. to 4 p.m.		
Fleetwood	Thurs.	... 9-30 a.m. to 12 noon	... Dental	
		9-30 a.m. to 12 noon	... Minor ailments	
		2 p.m. to 4 p.m.		
	Fri.	... 10 a.m. to 12 noon	... Ophthalmic	
Great Crosby	... Mon.	... 9-30 a.m. to 12 noon	... Dental	
		2 p.m. to 4 p.m.		
		10-30 a.m. to 12-30 p.m.	Orthopædic	... Nurse only.
	Tues.	... 9-30 a.m. to 12 noon	... Minor ailments	
		2 p.m. to 4 p.m.		
Great Crosby	Wed.	... 9-30 a.m. to 12 noon	... Dental	
		2 p.m. to 4 p.m.		
	Thurs.	... 9-30 a.m. to 12 noon	... Minor ailments... Nurse only.	Re-dressings.
		9-30 a.m. to 12 noon	... Dental	
		2 p.m. to 4 p.m.		
Great Crosby	Fri.	... 10-30 a.m. to 12-30 p.m.	Orthopædic	... Surgeon attends third Friday in each month only.
		2 p.m. to 4 p.m.		
		10 a.m. to 12 noon	... Ophthalmic	
	... Tues.	... 10 a.m. to 12 noon	... Dental	... Open alternate weeks only.

Township.	Days and Times of Opening.		Nature of work undertaken.	Remarks.
Haydock	... Mon.	... 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments... ... Dental	Nurse only. Re-dressings.
	Tues.	... 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Orthopædic ... Dental	... Surgeon attends second Tuesday in each month only.
	Wed.	... 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments ... Dental	
	Thurs.	... 10-30 a.m. to 12-30 p.m. 10-30 a.m. to 12-30 p.m.	... Ophthalmic ... Dental	... Open alternate weeks only. ... Open alternate weeks only.
	Fri.	... 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
Horwich	... Mon.	... 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments... ... Dental	Nurse only. Re-dressings.
	Tues.	... 9-30 a.m. to 12 noon 2 p.m. to 4 p.m. 10 a.m. to 12 noon	... Dental ... Artificial light	
	Wed.	... 10 a.m. to 12 noon 10 a.m. to 12 noon	... Ophthalmic ... Orthopædic	... Open every second Wednesday only. ... Surgeon attends first Wednesday in each month only. Nurse attends first and third Wednesday.
	Fri.	... 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments ... Dental	
	Sat.	... 10 a.m. to 12 noon	... Artificial light	
Irlam	... Mon.	... 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Tues.	... 9-30 a.m. to 12 noon	... Minor ailments	
	Wed.	... 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Thurs.	... 9-30 a.m. to 12 noon 9-30 a.m. to 12 noon 2 p.m. to 4 p.m. 2 p.m. to 4 p.m.	... Ophthalmic ... Dental ... Orthopædic	... Open alternate weeks only. ... Surgeon attends third Thursday in each month only.
	Fri.	... 9-30 a.m. to 12 noon	... Minor ailments	... Nurse only. Re-dressings.
Kearsley	... Mon.	... 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Ophthalmic ... Minor ailments	Nurse only. Re-dressings.
	Tues.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m. ... 10 a.m. to 12 noon	... Dental ... Orthopædic	... Nurse only.
	Wed.	... 2 p.m. to 4 p.m.	... Orthopædic	... Surgeon attends first Wednesday in each month only.
	Thurs.	... 9 a.m. to 12 noon	... Minor ailments	
	Fri.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
Lancaster	... Wed.	... 2 p.m. to 4 p.m.	... Orthopædic	... First Wednesday in each month only.
	Thurs.	... 10 a.m. to 12 noon	... Ophthalmic	... Open by arrangement when sufficient number of cases for treatment, usually monthly. Day changed to Monday during summer months.

Township.	Days and Times of Opening.		Nature of work undertaken.	Remarks.
Leyland	... Mon.	... 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments ... Orthopædic	Nurse only. Re-dressings. ... Surgeon attends first Monday in each month only.
	Tues.	... 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Wed.	... 9-30 a.m. to 12 noon	... Ophthalmic	... Open alternate weeks only.
	Thurs.	... 9-30 a.m. to 12 noon	... Minor ailments	
	Fri.	... 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
Litherland	... Mon.	... 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	Surgeon attends fourth Thursday in each month only. Nurse attends each Thursday, except fourth Thursday.
	Tues.	... 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments ... Dental	
	Wed.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Thurs.	... 9-15 a.m. to 12-15 p.m. 10 a.m. to 12 noon	... Ophthalmic ... Orthopædic	
		2 p.m. to 4 p.m.	... Dental	
	Fri.	... 9 a.m. to 10 a.m. 10 a.m. to 12 noon	... Inspection ... Minor ailments	
Littleborough	... Mon.	... 9 a.m. to 12 noon 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments ... Dental	Nurse only. Re-dressings ... Open alternate weeks only.
	Wed.	... 10 a.m. to 12 noon	... Ophthalmic	
	Thurs.	... 9 a.m. to 12 noon	... Minor ailments	
	Fri.	... 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
Nelson	... Fri.	... 2 p.m. to 4 p.m.	... Orthopædic	... Surgeon attends third Friday in each month only.
Ormskirk (A)	... Mon.	... 10 a.m. to 12 noon	... Minor ailments	Open alternate weeks only. (Re-dressings by Hospital Staff each day).
	Fri.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
Ormskirk (B)	... Fri.	... 10 a.m. to 12 noon	... Orthopædic	... Surgeon attends first Friday in each month only. Nurse attends each Friday, except third Friday.
Oswaldtwistle	... Mon.	... 9 a.m. to 12 noon 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments ... Dental	Nurse only. Re-dressings. ... Open alternate weeks only.
	Wed.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Thurs.	... 9 a.m. to 12 noon	... Minor ailments	
	Fri.	... 10 a.m. to 12 noon 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Ophthalmic ... Dental	

Township.	Days and Times of Opening.		Nature of work undertaken.	Remarks.
Padiham	... Mon.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Tues.	... 9-30 a.m. to 12 noon 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments ... Dental	
	Wed.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Thurs.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Ophthalmic ... Dental	... Open alternate weeks only.
	Fri.	... 9-30 a.m. to 12 noon 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments ... Dental	... Nurse only. Re-dressings.
Preseot	... Mon.	... 9 a.m. to 12 noon 9 a.m. to 12 noon	... Dental ... Minor ailments	... Nurse only. Re-dressings.
	Tues.	... 9 a.m. to 12 noon	... Dental	
	Wed.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental ... Ophthalmic	... Open alternate weeks only.
	Thurs.	... 9 a.m. to 12 noon	... Minor ailments	
	Fri.	... 2 p.m. to 4 p.m.	... Orthopædic	... Surgeon attends first Friday in each month only. Nurse attends each Friday, except third Friday.
Preston	... Wed.	... 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Orthopædic	... Surgeon attends fourth Wednesday in each month.
Ramsbottom	... Mon.	... 9 a.m. to 12 noon	... Minor ailments	... Nurse only. Re-dressings.
	Tues.	... 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Wed.	... 9 a.m. to 12 noon	... Minor ailments	
	Fri.	... 10 a.m. to 12 noon 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Ophthalmic ... Dental	... Open alternate weeks only.
Rishton	... Mon.	... 9-30 a.m. to 12 noon	... Minor ailments	... Nurse only. Re-dressings.
	Tues.	... 10 a.m. to 12 noon 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Ophthalmic ... Dental	... Open alternate weeks only.
	Wed.	... 2 p.m. to 4 p.m.	... Orthopædic	... Surgeon attends fourth Wednesday in each month only.
	Thurs.	... 9-30 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Fri.	... 9-30 a.m. to 12 noon	... Minor ailments.	
Rochdale	Mon.	... 2 p.m. to 4 p.m.	... Orthopædic	... Surgeon attends each week.
	... Tues.	... 9-30 to 12 noon	... Ophthalmic	... Open alternate weeks only.
Royton	... Tues.	... 9 a.m. to 12 noon 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments ... Dental	
	Wed.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
		10 a.m. to 12 noon	... Ophthalmic	... Open alternate weeks only.
	Thurs.	... 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Fri.	... 9 a.m. to 12 noon	... Minor ailments—	... Nurse only. Re-dressings.

Township	Days and Times of Opening.		Nature of work. undertaken.	Remarks.
Skelmersdale	... Wed.	... 1.45 p.m. to 4 p.m.	... Inspection	
Tyldesley	... Mon.	... 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Ophthalmie ... Orthopædie	... Open alternate weeks only. ... Nurse only.
	Tues.	... 9 a.m. to 12 noon 10 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments ... Dental	
	Wed.	... 10 a.m. to 12 noon	... Orthopædie	... Surgeon attends second Wednesday in each month only.
	Thurs.	... 10 a.m. to 12 noon 2 p.m. to 4 p.m. 2 p.m. to 4 p.m.	... Dental ... Minor ailments...	... Nurse only. Re-dressings.
Ulverston	... Mon.	... 9 a.m. to 12 noon	... Minor ailments	... Nurse only. Re-dressings.
	Tues.	... 2 p.m. to 4 p.m.	... Orthopædie	... First Tuesday in each month only.
	Wed.	... 9 a.m. to 12 noon 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Minor ailments ... Dental	
	Fri.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
Westhoughton...	Mon.	... 9 a.m. to 12 noon 9 a.m. to 12 noon	... Dental ... Minor ailments	
	Wed.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m. 10 a.m. to 12 noon	... Dental ... Ophthalmie	... Open every fourth Wed- nesday only.
		2 p.m. to 4 p.m.	... Minor ailments...	... Nurse only. Re-dressings.
	Thurs.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Fri.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
Whitefield	... Mon.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Tues.	... 9 a.m. to 12 noon	... Minor ailments	
	Wed.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Dental	
	Thurs.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m. 10 a.m. to 12 noon	... Dental ... Orthopædie	... Surgeon attends third Thurs- day in each month only.
	Fri.	... 9 a.m. to 12 noon 2 p.m. to 4 p.m.	... Ophthalmie ... Minor ailments.	... Open alternate weeks only. ... Nurse only. Re-dressings.
Wigan	... Mon.	... 10 a.m. to 12 noon	... Orthopædie	... Surgeon attends first Mon- day in each month only.

Arrangements have been made with the following Hospitals for the treatment of specified classes of defect, those marked with an asterisk being new arrangements made during the year :—

Aneoats Hospital, Manchester	... Tonsils and adenoids.
Ashton-under-Lyne Infirmary	... Tonsils and adenoids, eye defects, X-ray treatment of ringworm.
*Barton-upon-Irwell Park Hospital	... Tonsils and adenoids.
Blackburn Infirmary	... Tonsils and adenoids, eye defects, X-ray treatment of ringworm.
Bolton Infirmary	... Do.
Bury Infirmary	... Do.
Burnley Victoria Hospital	... Tonsils and adenoids ; eye defects.

*Fleetwood Hospital	... Tonsils and adenoids.
Hartley Hospital, Colne	... Tonsils and adenoids ; eye defects.
Leigh Borough Clinic	... Tonsils and adenoids.
Myrtle Street Hospital, Liverpool	... Tonsils and adenoids ; eye defects.
Oldham Infirmary	... Tonsils and adenoids ; eye defects ; X-ray treatment of ringworm.
Ormskirk Cottage Hospital	... Tonsils and adenoids ; eye defects.
Peasley Cross Hospital, St. Helens	... Do.
Preston Infirmary	... Tonsils and adenoids, eye defects, X-ray treatment of ringworm.
*Ramsbottom Cottage Hospital	Tonsils and adenoids.
St. Paul's Hospital, Liverpool	... Eye defects.
Ulverston Cottage Hospital	... Tonsils and adenoids.
Warrington Infirmary	... Tonsils and adenoids ; eye defects.
*Widnes Accident Hospital	... Tonsils and adenoids.
Wigan Infirmary	... Tonsils and adenoids.
Ethel Hedley Orthopædic Hospital, Windermere	... Crippling defects.
Home for Crippled Children, Bamford, near Rochdale	... Do.
Ancoats Hospital, Manchester	... Do.
Myrtle Street Children's Hospital, Liverpool	... Do.
Liverpool Children's Hospital, ... Heswall	Do.

MINOR AILMENTS.

These include such defects as running ears, external eye disease, skin diseases, &c., and treatment for them is available for approximately 50,000 children, additional provision having been made in Audenshaw, Oswaldtwistle, Padiham and Ulverston.

TONSILS AND ADENOIDS.

Arrangements are now in force with the following Hospitals and Clinics for the operative treatment of Tonsils and Adenoids :—Ancoats Hospital, Manchester ; Ashton-under-Lyne Infirmary, Barton-upon-Irwell Union Hospital, Blackburn Infirmary, Bolton Infirmary, Bury Infirmary, Burnley Victoria Hospital, Fleetwood Hospital, Hartley Hospital, Colne ; Leigh Borough Clinic, Myrtle Street Hospital, Liverpool ; Oldham Infirmary, Ormskirk Cottage Hospital, Peasley Cross Hospital, St. Helens ; Preston Infirmary, Ramsbottom Cottage Hospital, Ulverston Cottage Hospital, Warrington Infirmary, Widnes Accident Hospital, Wigan Infirmary.

During the year the number of children who received operative treatment for this condition was 1,780, of whom 1,451 were treated under the Committee's scheme.

TUBERCULOSIS.

The treatment of tuberculous school children is in the hands of the Tuberculosis Committee of the Lancashire County Council, and all cases for treatment are referred to the Tuberculosis Officer for the area concerned.

VISION.

The treatment of defects of vision is undertaken either in the Eye Departments of General Hospitals or in the Eye Departments of the Committee's own Clinics. In the former case it is undertaken by the Specialist Staff of the Hospital ; in the latter case by part-time Visiting Specialists. Arrangements have been made with the following Hospitals :—Ashton-under-Lyne, Blackburn, Bolton, Burnley, Bury, Colne, Oldham, Ormskirk, Preston, St. Helens, Warrington, Liverpool, Myrtle Street Eye and Ear Hospital, and St. Paul's Eye Hospital.

Visiting Specialists attend at the School Clinics in Ashton-in-Makerfield, Audenshaw, Dalton-in-Furness, Fleetwood, Haydock, Horwich, Irlam, Kearsley, Lancaster, Litherland, Leyland, Littleborough, Oswaldtwistle, Padiham, Preseot, Rishton, Rochdale, Royton, Ramsbottom, Tyldesley, Ulverston, Whitefield, and Westhoughton.

The number of children for whom Specialist eye treatment is available is approximately 120,000. The number of children who received treatment for defective vision or squint was 4,804, of whom 4,301 were dealt with under the Committee's scheme.

Arrangements have also been made with certain firms of opticians, in connection with each Ophthalmic Clinic or Hospital, to supply spectacles at a low fixed charge. In necessitous cases the charge is reduced or remitted altogether. The number of children who either purchased or received free spectacles under this scheme was 2,555.

In one area a local charity has arranged for the treatment of visual defect in Elementary School children, and provides spectacles free of charge to every child requiring them.

DENTAL DEFECTS.

The dental staff now consists of thirteen full-time and one part-time dental surgeons; each assisted by a nurse or dental attendant. Dental Clinics have been established in Ashton-in-Makerfield, Audenshaw, Dalton-in-Furness, Fleetwood, Great Crosby, Haydock, Horwich, Irlam, Kearsley, Leyland, Litherland, Littleborough, Ormskirk, Oswaldtwistle, Padiham, Prescott, Ramsbottom, Rishton, Royton, Tyldesley, Ulverston, Westhoughton, and Whitefield.

These Clinics serve schools with an average attendance of 45,000 children. The number of children who received treatment during the year was 17,061.

As it is impossible, owing to the large number requiring treatment, to attend to all children, the energies of the dentists are concentrated on the younger groups of children during the eruption of the first permanent teeth.

Apart from this routine work, the dentists treat the following classes :—

- (a) Expectant and Nursing Mothers, on the recommendation of the Medical Officers ;
- (b) Children under school age, similarly ;
- (c) Casuals.

Casuals are of three classes :—

- (a) Urgent cases, *e.g.*, toothache, dental abscess ;
- (b) Cases where the mouth has to be put into a clean condition previous to operation for tonsils and adenoids ;
- (c) Cases in which the Medical Officer requests that dental treatment should be given for some other medical reason, *e.g.*, anæmia.

ACCIDENTS TO SCHOOL CHILDREN.

The following table showing the accidents which happened to school children during the year is interesting :—

(1) Total number of Accidents reported	...	...	...	...	364
(2) Number of Accidents—Minor	...	...	...	...	292
(3) Number of Accidents—Fractures	...	...	...	...	70
(4) Number of more serious Accidents	...	...	...	...	2

The following first-aid materials are provided on the Schedule of School Supplies :—

Gauze Bandages, 1 in. in lengths of 6 yards.

Do. 2 in. do.

Boric Lint in rolls of 2 oz.

Cotton Wool in cartons of 4 oz.

Adhesive Plaster on $\frac{1}{2}$ -in. spools, $2\frac{1}{2}$ yards long.

CRIPPLING DEFECTS AND ORTHOPÆDICS.

The arrangements for dealing with crippled children were fully described in last year's Report. Since then the scheme has been further increased by the inclusion of the following Authorities :—County Borough of Bury, Borough of Accrington, and the Urban Districts of Hindley and Golborne. Up to the present 22 After-Care Centres have been established at Ashton-in-Makerfield, Ashton-under-Lyne, Burnley, Chadderton, Fleetwood, Haydock, Horwich, Irlam, Kearsley, Lancaster, Leyland, Litherland, Nelson, Ormskirk, Prescott, Preston, Rishton, Rochdale, Tyldesley, Ulverston, Whitefield, and Wigan. For the purposes of After-Care, three thoroughly trained and experienced After-Care Nurses have been appointed, who are highly expert in plaster and appliance work.

The following table shows the number of children treated during 1928 :—

	Ancoats Hospital.	Biddulph Hospital.	Ethel Hedley Hospital.	Rochdale Crippled Children's Home.	Myrtle Street Hospital.	Heswall Country Hospital.
Inmates, 1st Jan., 1928	...	...	20	15	2	16
Admitted during the year	4	179	45	26	32	37
Discharged during the year	4	95	51	26	30	37
Remaining on 31st Dec., 1928	...	84	14	15	4	16

AFTER-CARE CENTRES.

The following table is a summary of the work done during the year in the After-Care Centres :—

No. of individual children attended	...	...	...	...	...	...	2308
Total no. of attendances made	...	...	...	...	...	...	9967
No. of children referred to Consultant Orthopædic Surgeon at Hospital (Ancoats or Myrtle Street)	...	...	...	...	...	...	193
No. of children recommended operative treatment by Orthopædic Surgeons at Centre or Hospital	...	...	...	...	...	...	459
No. of plasters made at Centres	...	...	...	...	...	...	249
No. of surgical appliances, <i>e.g.</i> , boots, irons, &c., supplied through Centres	...	...	...	...	...	...	1162
No. of children given remedial exercises	...	...	...	...	...	...	773
No. of children for whom treatment has been refused by parents or guardians	...	...	...	...	...	...	100

The following table shows the defects from which the children seen in the After-Care Centres were suffering :—

Paralysis—		Deformities, Traumatic—	
(a) Infantile—Upper Limb	... 38	Fractures of Upper and Lower	
Lower Limb	... 274	Limbs	... 68
Upper and Lower		Subluxations	... 2
Limbs	... 15	Dislocations	... 3
(b) Spastic—Monoplegia	... 12	Displaced Epiphysis	... 2
Diplegia	... 22	Contusions	... 10
Paraplegia...	... 51	Tendons	... 5
Hemiplegia	... 106	Amputations	... 2
(c) Birth Palsy	... 74	Sprains	... 2
Deformities, Congenital—		Intra Uterine Amputation of	
Hydrocephalus	... 3	Hand	... 1
Cleft Palate	... 4	Intra Uterine Amputation of	
Scoliosis	... 11	Hand and Foot	... 1
Sprengel's Shoulder	... 3	Coxa Vara	... 1
Rudimentary and Malformed		Nerve Injuries	... 2
Limbs	... 8	Other Deformities	... 4
Talipes Equino Varus	... 90	Deformities, Other—	
Talipes Equino Valgus	... 7	Pronated Feet	... 38
Pes Calcaneus	... 5	Pes Cavus	... 22
Torticollis	... 64	Pes Varus	... 5
Torticollis, Spasmodic	... 2	Pes Planus	... 133
Spina Bifida	... 8	Genu Recurvatum	... 1
Spina Bifida with Club Foot	... 4	Claw Feet	... 10
Achondroplasia	... 1	Hallux Valgus	... 9
Metatarsus Varus	... 7	Scoliosis	... 87
Absence of Bones	... 6	Kyphosis	... 106
Club Hand	... 2	Lordosis	... 3
Dislocation of Hip	... 42	Synostosis Radius and Ulna	... 1
Subluxation of Hip	... 1	Pseudo Coxalgia	... 10
Contractions	... 7	Hammer Toes	... 18
Syndactylism	... 8	Birth Fractures	... 4
Wedged Vertebra	... 1	Miscellaneous	... 6
Adduction Fifth Toe	... 3	Rickets—	
Supernumerary Digits	... 4	Genu Varum	... 163
Other Deformities	... 13	Genu Valgum	... 206
		Genu Valgum and Coxa Vara	... 7

Genu Varum and Coxa Vara ...	18	Elbow	4
Generalised	50	Ankle	2
Acute	46	Multiple	1
Renal	1	Tumours—	
Delayed (Dwarf)	5	Lymphatic Hygroma	1
Inflammations—		Exostosis—Multiple	1
Arthritis	10	Lower Limb	1
Arthritis, Suppurative	8	Naevus	2
Arthritis, Infective	8	Sarcoma	1
Periostitis and Osteitis	6	Ganglion	6
Perthe's Disease	5	Chondroma	2
Synovitis	11	Fibroma	2
Bursitis	6	Lipoma	2
Epiphysitis	3	Cyst	7
Pyæmia	1	Unclassified	32
Schlatter's Disease	3	Nervous Diseases—	
Osteomyelitis	21	Mental Deficiency	7
Dactylitis	2	Encephalitis Lethargica	8
Other	5	Polio Encephalitis	2
Tuberculosis—		Other Medical Neuroses	14
Active—Knee	5	Miscellaneous—	
Hip	10	Kohler's Disease... ..	3
Elbow	1	General Muscular Hypotonia	2
Os Calcis	1	Hemihypertrophy	5
Spine	6	Empyema	1
Dactylitis	1	Malnutrition	1
Ankle	1	Unclassified	96
Old—Knee	10		
Spine	18		2308
Hip	15		

The following table shows concisely the work done during the year in the Hospitals with which the Committee has arrangements :—

Defect.	No. of Cases treated.	Cured.	Improved.	Died.	Stationary.
Infantile Paralysis	34	...	33	...	1
Spastic Paralysis	13	...	13	...	...
Birth Palsy	7	...	7	...	...
Deformities—					
Congenital	60	20	34	1	5
Traumatic	6	...	5	...	1
Other... ..	20	4	15	1	...
Rickets	57	36	17	1	3
Inflammations—					
Arthritis	2	1	1	...	...
Ankylosis	1	1	...	...	...
Osteomyelitis	8	6	2	...	...
Trophic Ulcer	2	2	...	...	...
Tumours—					
Exostosis	2	...	2	...	...
Pyæmia	1	...	1	...	...
Haemophilic	1	...	...	...	1
Totals	214	70	130	3	11

The following table shows the number and character of the operations performed at the Committee's Hospital at Biddulph from March, 1928, to February, 1929 :—

<i>Infantile Paralysis</i>		Claw Foot	15	
		Stabilisation of foot	14	
		Tendon Transplantation	4	
		Arthrodesis Shoulder	1	
		—		34
<i>Spastic Paralysis</i>		... Cervical Sympathectomy	2	
		Obturator Neurotomy... ..	3	
		Superior Gluteal Neurotomy	2	
		Elongation Tendo-Achilles	7	
		Claw Feet	2	
		—		16
<i>Birth Palsy</i>		Exploration Braehial Plexus	4	
		Division of internal rotators	4	
		—		8
<i>Nerve Injuries</i>		Ulnar nerve—suture	1	
		—		1
<i>Congenital Torticollis</i> ... ..		... ..	...	21
<i>Congenital Club Foot</i>		Stabilisation	6	
		Tenotomy and Wrench	10	
		—		16
<i>Congenital Dislocation of the Hip</i>		Manipulation	13	
		Construction of Acetabular Shelf	5	
		Open Reduction	3	
		—		21
<i>Rickets</i>		Osteotomy for genu-valgum and genu-varum	9	
		Osteoclasis	6	
		—		15
<i>Tuberculosis Arthritis Hip</i>		Extra articular arthrodesis	4	
<i>Coxa Plana</i>		Extra artieular arthrodesis	1	
<i>Coxa Vara</i>		Trans trochanterie osteotomy	2	
		—		7
<i>Fractures...</i>		Malunion	2	
		—		2
<i>Osteomyelitis</i>		Bone graft	1	
		—		1
<i>Miscellaneous</i>		Osteotomies	3	
		Baker's Cyst Knee	2	
		Manipulations and small operations...	12	
		—		17
				<hr/>
				159
				<hr/>

STATISTICS OF MEDICAL TREATMENT.

The following tables show the amount of treatment which has been obtained during 1928. The kind of treatment and the results are also specified.

The first set of tables gives this information about those children who were examined at the routine medical inspection immediately preceding, *i.e.*, in general, those children whose medical inspection took place in 1927.

TREATMENT OF DEFECTS.

New Cases.

DISEASE OR DEFECT.	NUMBER OF CHILDREN.							
	Re-ferred for Treat-ment.	Treated.			Result.			No Infor-mation.
		Under Author-ity's Scheme.	Other-wise.	Total.	Cured.	Im-proved.	Un-changed	
1	2	3	4	5	6	7	8	
Minor Ailments (Skin)—								
Ringworm—Scalp ...	117	50	54	104	97	...	7	13
Ringworm—Body ...	46	31	15	46	45	...	1	...
Scabies ...	15	6	9	15	15	...	...	...
Impetigo ...	494	180	281	461	455	6	...	33
Other Skin Disease ...	46	44	2	46	46	...	...	...
Ear Disease ...	354	109	215	324	276	47	1	30
Eye Disease (external and other)	757	212	303	515	290	193	32	242
Dental Disease ...	699	229	327	556	429	127	...	143
Other Diseases ...	1944	430	892	1322	618	658	46	622

TREATMENT OF VISUAL DEFECT.

NUMBER OF CHILDREN.

Referred for Refraction.	Submitted to Refraction.				Result of Refraction.								No informa- tion.
	Under Au- thority's Scheme— Clinic or Hospital.	By Private Prae- titioner or Hospital.	Other- wise.	Total.	Under Authority's Scheme— Clinic or Hospit'l	By Private Practitioner Hospital or otherwise.		Treatment other than by Glasses.		For whom no Treat- ment was considered necessary.			
						Glasses Prescrbd.	Glasses Obtained.	Glasses Prescrbd.	Glasses Obtained.		Recom- mended.	Re- ceived.	
3328	1957	170	209	2336	1821	1646	360	324	42	38	113	992	

TREATMENT OF DEFECTS OF NOSE AND THROAT.

Referred for Treatment.	NUMBER OF CHILDREN.				No information.
	Received Operative Treatment.			Received other forms of Treatment.	
	Under Authority's Scheme—Clinic or Hospital.	By Private Practitioner or Hospital.	Total.		
1966	686	255	941	242	783

The following set of tables gives similar information about those children who were recommended to obtain treatment at any inspection prior to the last :—

TREATMENT OF DEFECTS.

Old Cases.

DISEASE OR DEFECT.	NUMBER OF CHILDREN.							
	Re-ferred for Treat-ment.	Treated.			Result.			No Infor- mation.
		Under Autho- rity's Scheme	Other- wise.	Total.	Cured.	Im- proved.	Un- changed	
1	2	3	4	5	6	7	8	
Minor Ailments (Skin)—								
Ringworm—Scalp ...	21	5	13	18	12	4	2	3
Ringworm—Body ...	2	1	1	2	2	...	...	...
Scabies ...	1	...	1	1	1	...	...	...
Impetigo ...	29	4	24	28	27	1	...	1
Other Skin Disease ...	29	3	20	23	18	3	2	6
Ear Disease ...	195	39	44	83	43	30	10	112
Eye Disease (external and other)	83	22	22	44	28	13	3	39
Dental Disease ...	591	173	133	306	137	168	1	285
Other Diseases ...	467	42	166	208	72	118	18	259

TREATMENT OF VISUAL DEFECT.

Referred for Refraction.	NUMBER OF CHILDREN.											
	Submitted to Refraction.				Result of Refraction.							No informa- tion.
	Under Au- thority's Scheme— Clinic or Hospital.	By Private Prac- titioner or Hospital.	Other- wise.	Total.	Under Authority's Scheme— Clinic or Hospit'l		By Private Practitioner Hospital or otherwise.		Treatment other than by Glasses.		For whom no Treat- ment was considered necessary.	
					Glasses Prescrbd.	Glasses Obtained.	Glasses Prescrbd.	Glasses Obtained.	Recom- mended.	Re- ceived.		
597	187	29	85	301	176	106	167	69	7	5	12	296

TREATMENT OF DEFECTS OF NOSE AND THROAT.

Referred for Treatment.	NUMBER OF CHILDREN.				
	Received Operative Treatment.			Received other forms of Treatment.	No information.
	Under Authority's Scheme—Clinic or Hospital.	By Private Practitioner or Hospital.	Total.		
544	112	74	186	46	312

OPEN-AIR EDUCATION.

No special Open-air Schools exist in the Authority's area, but in warm weather many classes, especially in the Infant Departments, are taken outside.

PHYSICAL TRAINING.

The physical training, as described in previous Reports, is under the general supervision of the County Medical Officer and his staff. During the year the Inspector of Physical Exercises visited 418 schools (435 Departments) and examined the children in physical exercises and organised games.

Grants in aid of organised games have been made by the Elementary Sub-Committee of the Education Committee for the past nine years, the amount of the grants having steadily increased.

This year again shows an enlargement in the scope of the arrangements for Organised Games in the schools. New Associations continue to be formed in all parts of the County, and there is no sign of any diminution in the enthusiasm with which the established Associations are maintained. The organisation of games is difficult in many of the rural areas of the County, as many of the schools do not contain a sufficient number of older boys or girls to produce a team for either sex, and even where the numbers are sufficient distances make it difficult to arrange inter-school matches; several Associations are however now flourishing in such areas. It is interesting to note that in some cases, where the provision of facilities would otherwise be impossible, two small schools in the same village have joined together to provide joint teams. Football remains the predominant game of nearly all Associations, the organisation of cricket being more affected by the weather, the shortness of the season, and the incidence of the summer holidays. There is a steady increase in the organisation of games for girls, and in addition to Rounders many schools are now playing Stoolball and Net-ball. The development of Hockey, however, is seriously handicapped in many districts by the lack of suitable playing fields.

The Committee's Regulations allow of a Grant equal to half the expenditure of an Association during the year, with a maximum grant of £50, so that considerable sums must be raised from voluntary sources by all Grant-Aided Associations. There are, moreover, various Schools and Associations which do not ask for assistance from the Education Committee, and some of these Associations are not only self-supporting, but also make contributions to charities. As the whole of the work involved both by the raising of funds and the organisation of games is voluntarily undertaken by the teachers out of school hours, in addition to their ordinary duties, the Committee will realise how much of the progress in this branch of activities is due to the interest and enthusiasm of the teachers. Considerable help can be and is given every year by patrons, who present trophies for competition, and by members of the Local Committees, the Managers of schools and the District Clerks.

The growth in Organised Games under the Committee's Scheme is shown in the following table :—

Year.	No. of Associations Grant-Aided.	No. of Schools in the Associations.
1920-21	4	27
1921-22	7	42
1922-23	17	146
1923-24	16	134
1924-25	15	105
1925-26	22	142
1926-27	27	209
1927-28	34	238
1928-29	37	230
Applications for grants		
1929-30	42	253

Lack of playing fields is still the chief obstacle in the way of the successful working of the Associations, but the difficulty appears to have been less than in previous years.

The following table shows the Associations to which grants are given :—

District No.	Name of Association.	No. of Schools or Depts.
1	Leven and Crake Valleys	9
1	High Furness Rural	7
1	Cartmel District Schools Athletic Association ...	6
2	South Lonsdale Schools	10
3	Garstang and District Schools Games	14
4	Thornton Elementary Schools Games	5
7	South Ribble Elementary Schools Games Fed. ...	29
	(a) South Ribble Rounders' League.	
	(b) West Lanes. Rural Football Association.	
	(c) Leyland School Boys' Athletic Games Association.	
	(d) Leyland School Girls' Games Association.	
	(e) Walton-le-Dale Football Association.	
9	Paddock Association	7
10	No. 10 District	6
11	No. 11 Area Organised Games	7
12	No. 12 Area Organised Games	8
14	Adlington Schools' Sports	3
16	Ormskirk & District Organised Games Association	9
19	Upholland Elementary Schools' Sports	5
19	Orrell Schools Games' Association	2
19	Ashton-in-Makerfield Schools' Sports	4
19	Abram, Bryn Gates, and Stubshaw Cross... ..	2
19	Ashton-in-Makerfield Central	2
21	Westhoughton Schools' Athletic	6
22	Kearsley Athletic Association	12
23	Ramsbottom Schools' Sports' Association ...	10
26	Littleborough and Smallbridge	10
26	Whitworth Schools' Games	5
26	Milnrow Schools' Games	5
26	Norden Schools' Games	4
28	Litherland... ..	2
30	Haydock Schools' Sports	4
30	Newton-in-Makerfield Schools' Sports	7
30	Penketh and Great Sankey	2
30	Warrington and District Teachers'	2
31	Atherton Schools' Athletic	10
31	Tyldesley	10

District No.	Name of Association.	No. of Schools or Depts.
32	Newton-in-Makerfield Association, Golborne Sec.	2
32	Newton-in-Makerfield Sports Assoc., Glazebury...	3
33	Urmston and Flixton District Schools' Athletic	6
33	Irlam and Cadishead Schools' Sports	6
34	Worsley and District	7
35	Denton and Haughton Schools' Cricket League...	5
		<hr/> 253

SWIMMING.

The table given below shows the progress made in Instruction in Swimming during recent years :—

Year.	No. of Districts receiving Grant.	No. of Departments taking part.
1923-24	7	35
1924-25	12	62
1925-26	14	87
1926-27	18	110
1927-28	19	116
1928-29	20	113
Applications for grants, 1929-30	22	131

Great enthusiasm is shown as regards instruction in Swimming in nearly all schools in the County which are within convenient reach of a Swimming Bath, and a great increase in the number of children participating is only prevented by the inaccessibility of a Bath or inadequate facilities for the required numbers. It will be seen from the table that many schools attend Baths provided by neighbouring Boroughs, and the Borough Authorities have proved very willing to arrange times to suit the schools, and in many cases to loan the services of the Borough Swimming Instructors for the fee charged. One Borough allows school children attending during term-time to attend at the same times weekly during the holidays without further charge.

Instruction in Swimming in many schools has to be confined to teaching to swim a short distance, owing to lack of facilities, but wherever there is accommodation distance swimming, diving and life-saving are encouraged, and annual Galas are usually held in this connection. Frequent reference is made in the reports from the schools to the improvement in the physique and cleanliness of children receiving instruction.

The following table shows the Schools and Districts to which grants are made :—

District No.	School or Area.	No. of Schools or Depts.	Baths to be attended.
2	Lancaster Rural	2	Lancaster
4	Fleetwood and Thornton ...	7	Fleetwood Open-Air Baths
5	Kirkham and District	7	Kirkham
6	Longridge	2	Preston
7	North Meols, Banks P.M.	1	Southport
9	Oswaldtwistle, Belthorn and Daisy Green	1	Blackburn

District No.	School or Area.	No. of Schools or Depts.	Baths to be attended.
10	Blackburn Rural	3	Blackburn
11	Brierfield and District	6	Burnley
12	Barrowford and District	5	Nelson and Colne
13	Padiham and District	11	Burnley
15	Chorley Rural	5 8	Brinscall Withnell
16	Ormskirk	1	Southport
20	Turton	1	Bolton
21	Westhoughton and Horwich ..	6	Bolton
22	Little Hulton and Kearsley ...	4	Farnworth
25	Whitefield and District	5	Radcliffe
26	Littleborough, Milnrow, Norden, Whitworth and Wardle	7 2	Rochdale Bacup
28	Litherland	7	Bootle
30	Newton-in-Makerfield, &c. ...	6 4	Warrington St. Helens
31	Atherton, Tyldesley and Astley ...	10 10	Atherton Tyldesley
35	Audenshaw, Failsworth, Denton and Lees	5 1 1 1 1	Newton Heath Gorton Whitworth Hyde Oldham
	Totals	<u>131</u>	

CO-OPERATION OF PARENTS.

During the year the Medical Officers interviewed 7,219 parents in schools and visited 897 homes, whilst the Nurses interviewed in school 1,320 parents and visited 16,055 homes ; 97,871 attendances were made by children of pre-school age at Child Welfare Centres, each one representing an interview of a parent with either Doctor or Nurse.

In addition, the Nurses paid 91,336 visits to the homes of young children, infants or expectant mothers. The opportunities thus shown for interviews with parents are frequent, and there is, at the present time, scarcely any of the hostility which was not uncommon in the early days of School Medical Inspection.

CO-OPERATION OF TEACHERS.

Teachers still continue to take an eager interest in the work of medical inspection and place all facilities at the disposal of the Medical Officer and School Nurse. Their advice with regard to home conditions and status of pupils and parents is always welcomed.

CO-OPERATION OF SCHOOL ATTENDANCE OFFICERS.

The following table shows some of the figures relating to the School Attendance Officers' duties in 1928 :—

No. of interviews with Medical Officers	...	...	...	1,039
No. of interviews with School Nurses	...	...	...	1,779
No. of visits to homes, arising out of Medical Inspection	...			2,314
No. of cases specially presented to the Medical Officers and School Nurses	...	...	...	2,217

CO-OPERATION OF RATE-AIDED AND VOLUNTARY BODIES.

The Medical Officers are in touch with the rate-aided bodies such as Boards of Guardians and District Councils, the School Attendance Officers, School Nurses and Health Visitors very often being the medium of communication.

The Attendance Officers continue to perform numerous duties not directly connected with school attendance. The supervision of the employment of children entails work at irregular hours and often on Saturdays and Sundays. Other work connected with the physical welfare of children and with the activities of the School Medical Department continues to increase. Cases where children are neglected by their parents are frequently dealt with in co-operation with the National Society for the Prevention of Cruelty to Children without resorting to prosecution. The Attendance Officers are also frequently called on to arrange for sending children to convalescent homes or to the seaside for recuperation after illness, and they are often closely concerned with the arrangements for the transfer of children to Special Schools. The Annual Reports from the districts invariably record gratifying instances of active philanthropic work, of which the following examples may be quoted :—

- (a) 162 pairs of boots and clogs provided. Amount expended, £63 ls. 11d.
- (b) 62 pairs of clogs and several parcels of clothing provided.
- (c) 48 pairs of clogs provided, also 13 lbs. virol and 40 lbs. cod liver oil and extract of malt provided.
- (d) 70 pairs of clogs provided.
- (e) 43 pairs of clogs provided.
- (f) 30 pairs of clogs provided.
- (g) 115 pairs of clogs provided.
- (h) 450 pairs of clogs issued.
- (i) Relief, consisting of food, medicine, clothes or footwear, cost £21 10s. 0d.
- (j) Clog Fund expended £100 7s. 0d.

This list is not exhaustive, and does not give a full idea of the personal interest which is taken by the Officers in any of their difficult cases. Instances are not lacking of actual contributions from the Officers' own pockets in cases of extreme need.

The Local Area Clerks are fully acquainted administratively and otherwise with the voluntary agencies for the relief of necessitous school children.

BLIND, DEAF, DEFECTIVE, AND EPILEPTIC CHILDREN.

The methods and policy of the Committee for ascertaining and dealing with children who are defective within the meaning of the Elementary Education (Blind and Deaf Children) Act, 1899 and 1914, are unchanged and have previously been described.

BLIND CHILDREN.

The number of children on the Special Register who were considered as blind children in the year 1928 was 88 boys and 76 girls. Of these, 18 boys and 23 girls were totally blind, and 70 boys and 53 girls had some residual vision.

Attending Certified Schools or Classes for the Blind were 33 boys and 39 girls. During the year 24 blind children were reported on, and in the following table the causes of blindness are reported as :—

Nystagmus	...	...	...	...	...	...	4
Ophthalmia Neonatorum	...	...	...	...	...	...	4
Congenital	...	...	...	...	...	...	1
Congenital Cataracts	...	...	...	...	...	...	4
Corneal Opacities	...	...	...	...	...	...	3
Progressive Myopia	...	...	...	...	...	...	2
Retinitis Pigmentosa	...	...	...	...	...	...	1
Optic Atrophy	..	...	...	...	...	...	1
Optic Neuritis	..	...	...	...	...	...	1
Choroiditis	...	...	...	...	...	...	1
Keratitis	...	...	...	...	...	...	2
							<hr/>
							24
							<hr/>

The number of children of Elementary School age who were maintained in 1928 at the following Institutions for the Blind was 33 boys and 39 girls. The annual cost of maintenance was £4030 or an average cost of £55 19s. 5d. a child.

	Boys.	Girls.	Total.
Burnley Blind School	1 ...	1 ...	2
Catholic Blind Asylum, Liverpool ...	2 ...	5 ...	7
Homes for the Blind, Fulwood ...	9 ...	6 ...	15
Liverpool School for the Blind ...	4 ...	5 ...	9
Oldham Blind School	5 ...	1 ...	6
Thomasson Memorial School, Bolton ...	4 ...	7 ...	11
Henshaw's Institution, Manchester ...	8 ...	11 ...	19
Sunshine Home, Southport	— ...	3 ..	3
	—	—	—
	33 ...	39 ...	72
	—	—	—

DEAF CHILDREN.

On the Register for 1928 there were 83 boys and 63 girls, of whom 31 boys and 28 girls were totally deaf, and 52 boys and 35 girls had residual hearing. Of all these 146 children, there were in attendance at the Special Certified Schools or Classes for the Deaf 50 boys and 38 girls, as shown below. The annual cost of maintenance was £5930 10s., or an average cost of £67 7s. 10d. a child.

	Boys.		Girls.		Total.
Burnley Deaf School	2	...	1	...	3
Liverpool School for the Deaf... ..	4	...	3	...	7
Oldham Deaf School	1	...	2	...	3
Royal Schools for the Deaf, Manchester	22	...	17	...	39
St. John's Institution, Boston Spa ...	3	...	2	...	5
Thomasson Memorial School, Bolton...	3	...	7	...	10
Royal Cross Schools for the Deaf, Preston	15	...	6	...	21
	—		—		—
	50	...	38	...	88
	—		—		—

During the year 17 deaf children of Elementary School age were reported on, and the following causes of their deafness are shown :—

Congenital	...	...	...	...	...	9
Meningitis	...	...	...	...	...	4
Otitis Media	...	...	...	...	...	2
Catarrh of Eustachian tube	...	...	...	...	...	1
Double Ottorrhoea	...	...	...	...	...	1
						<hr/>
						17
						<hr/>

The importance of sending these cases for special training at the earliest age, at four if possible, cannot be sufficiently impressed on parents and teachers ; time lost at the beginning can never be recovered.

EPILEPTIC CHILDREN.

On the Register there are noted 147 boys and 78 girls as suffering from Epilepsy, of whom 56 are severe and 169 not severe. Three of these children are maintained at Institutions for Epileptics, at a cost of £210 12s., or an average cost of £70 4s. a child.

MENTALLY DEFECTIVE CHILDREN.

There were, in 1928, 436 children noted in the Elementary Education Area as being feeble-minded, viz., 261 boys and 175 girls. In addition, there were notified to the Local Control Authority, in this case the Lancashire Asylums Board, 3 feeble-minded children, 24 imbeciles, and 10 idiots as being ineducable.

SECONDARY, CONTINUATION, AND TECHNICAL SCHOOLS.

The medical inspection of the pupils in attendance at Secondary, Continuation, and Technical Schools was commenced on 1st September, 1920, and is confined to those schools provided by or wholly financed by the Committee.

At the present time there are 48 schools, consisting of 39 Secondary Schools, 5 Technical Schools, and 4 Continuation Schools in which medical inspection is conducted.

The girls attending these schools are medically examined by a woman Medical Officer. The boys are examined by the male Medical Officers, each Assistant County Medical Officer being responsible for the inspection of the boys of the schools within his own area, and also in the adjoining areas in those cases where the Medical Officer in charge is a woman.

The medical staff have again received the whole-hearted co-operation of most of the teachers, and also of the parents of those pupils who required treatment.

METHOD OF INSPECTION.

The methods of inspection were described in detail in previous Annual Reports, and they need not be repeated here.

In the following table the pupils attending these schools are shown in two groups, *i.e.*, those attending Secondary Schools and those attending Technical and Continuation Schools. The table shows the number of pupils examined during 1928 in the various age groups :—

Age.	Secondary Schools.		Technical and Continuation Schools.	
	No. of Pupils examined.		No. of Pupils examined.	
	Boys.	Girls.	Boys.	Girls.
8	14	7	...	...
9	31	15	...	...
10	124	83	...	...
11	585	375	...	...
12	1,042	790	14	...
13	960	742	95	5
14	1,027	689	175	105
15	802	574	165	146
16	430	260	74	4
17	181	148	13	1
18	75	80	2	...
19	9	9	...	...
TOTALS ...	5,280	3,772	538	261

Boys.

Girls.

			Ages 8-11.	Age 12.	Age 13.	Age 14.	Age 15.	Age 16.	Ages 17-19	Ages 8-11.	Age 12.	Age 13.	Age 14.	Age 15.	Age 16.	Ages 17-19	
Ear Diseases.	{	Defective Hearing	T	0.4	0.4	0.1	...	0.1	0.7	...	1.0	0.8	0.8	0.7	1.0	0.8	...
		O	0.9	1.0	0.8	0.6	0.6	0.2	0.7	0.8	0.9	1.5	1.2	0.5	1.9	...	
		Otitis Media	T	0.4	0.3	0.2	0.3	0.2	0.2	...	0.4	0.4	0.3	0.1	...	0.8	...
		O	0.1	0.2	0.2	0.1	0.4	...	...	...	0.1	...	...	0.2	...	...
Other Ear Diseases	T	0.8	0.5	0.2	0.3	0.2	0.2	0.4	0.2	0.3	...	0.4	0.3	...	...	...
	O	0.1	0.3	0.2	0.2	0.1	0.9	...	...	0.3	...	0.1	0.3	...	...	...
	Enlarged Tonsils	T	0.4	0.7	0.9	1.2	0.7	0.9	...	4.6	3.0	3.2	3.2	2.9	1.2	0.8	
	O	8.8	7.7	7.6	6.5	5.5	5.3	4.9	15.4	15.4	16.7	13.9	10.8	12.3	7.6		
Adenoids.....	T	0.3	0.7	0.1	0.1	0.4	...	...	...	...	...	0.1	...	...	...	...
	O	1.2	1.7	1.5	0.1	0.5	...	...	0.2	0.1	0.3	0.3	...	...	...	...
	Enlarged Tonsils and Adenoids ..	T	0.3	0.4	0.2	0.2	0.2	0.2	...	0.4	1.4	0.9	0.3	0.2	...	...
	O	1.5	1.7	2.0	1.7	0.6	0.7	0.4	0.8	1.0	...	0.6	0.2	...	...	...
Enlarged Cervical Glands	T	...	0.09	...	...	...	...	...	0.4	...	...	0.1	0.2	0.4	...	...
	O	6.4	5.9	4.4	4.4	2.2	2.3	1.1	4.2	4.2	2.3	2.0	0.9	0.8	1.7	...	
	Defective Speech	T	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	O	0.9	0.3	0.3	0.3	0.3	...	...	...	0.3	0.1	...	0.2	...	...	...
Teeth.	{	Four or more Carious	T	11.7	10.3	11.6	10.2	11.5	10.7	11.3	8.7	11.1	12.4	12.6	12.4	8.8	15.2
		O	4.2	1.8	2.1	1.7	1.0	1.6	2.3	5.0	2.8	2.2	3.6	5.7	3.5	0.4	
		Sepsis	T	0.1	0.1	0.1	0.1	0.4	0.2
		O	0.2	0.1	0.1
Organic	T	...	...	...	...	...	...	...	...	...	0.1	0.1	0.2	0.4	...	...
	O	1.1	0.9	1.4	0.6	0.9	0.5	0.4	0.4	0.8	1.1	1.2	0.5	0.8	0.8	...	
	Functional	T	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	O	0.9	1.0	0.8	1.8	2.0	1.4	2.3	1.0	1.1	0.9	0.6	1.2	0.4	0.4	...	
Anæmia	T	...	...	0.1	...	0.1	...	...	...	0.4	0.5	0.8	0.6	0.9	0.4	0.8
	O	0.4	0.09	0.1	...	0.6	0.5	...	0.4	1.5	0.5	2.6	2.6	3.1	2.5	...	
	Bronchitis	T	...	...	...	...	...	0.2	...	...	...	...	...	...	...	...
	O	0.5	0.8	0.9	0.5	0.4	0.5	...	...	0.1	...	...	...	...	...	...
Other Non-Tubercular Diseases	T	...	...	...	...	...	...	...	...	0.1	...	...	...	...	...	...
	O	...	...	0.1	...	0.1	...	...	0.4	0.5	0.4	0.3	0.3	0.4	0.4	...
	Pul- monary.	O	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	T	...	...	...	...	...	...	...	...	...	0.1	...	...	...	...	...
Suspected	T	...	...	...	...	...	...	...	...	...	0.1	...	...	...	...	...
	O	...	...	...	...	...	...	...	0.2	0.5	0.7	1.0	0.3	0.4	0.4	...
	Glands.....	T	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	O	...	0.09	...	...	0.1	...	...	...	...	0.1	0.1	0.2	...	...	...
Spine	T	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	O	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hip	T	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	O	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Bones and Joints	T	...	...	...	0.1	0.1	...	...	...	...	...	...	...	...	...	...
	O	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Skin	T	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	O	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Epilepsy	T	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	O	...	...	...	...	...	...	...	0.2	...	...	...	0.2	...	...	...
	Chorea.....	T	0.1	0.09	...	...	0.1	0.2	...	...	...	...	...	...	...	...
	O	...	...	...	...	...	...	...	...	0.4	...	...	...	...	...	...
Infantile Paralysis.....	T	...	...	0.1	0.1	...	...	...	...	...	...	...	...	...	...	...
	O	0.3	0.3	0.1	0.1	...	0.2	0.4	0.2	...	...	...	...	...	...	...
	Rickets	T	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	O	0.8	0.09	...	...	0.1	...	...	...	...	...	...	...	...	...	...
Spinal Curvature	T	...	...	...	...	...	...	...	...	0.2	0.1	0.4	...	...	...	...
	O	0.7	0.4	0.1	0.1	0.1	0.2	...	1.0	1.6	1.2	0.9	0.5	0.8	0.4	...	
	Other Forms	T	0.4	0.6	0.2	...	...	...	...	0.4	...	0.1	...	1.2	...	...
	O	1.6	0.4	0.2	1.1	0.5	0.2	...	2.3	2.4	2.2	2.0	2.1	2.3	0.8	...	
Other Diseases or Defects	T	0.4	0.6	0.3	0.3	0.7	0.2	0.4	1.2	1.0	1.5	2.5	1.9	2.3	2.9	...	
	O	2.3	1.2	1.4	1.9	1.9	1.4	1.5	2.7	1.9	4.3	7.1	7.0	8.5	11.4	...	

The following table gives a summary of the visual acuity, as determined by the Snellen Test Types, of all the pupils examined :—

SECONDARY SCHOOLS.

Boys.

Age last Birthday.	Number Examined.	6		9		12		18		24		36		60		0	
		R.	L.	R.	L.	R.	L.	R.	L.	R.	L.	R.	L.	R.	L.	R.	L.
8	754	85.1	82.7	5.6	7.3	2.1	1.4	2.0	2.4	1.8	2.2	1.6	2.1	1.3	0.8	0.4	0.9
9																	
10																	
11																	
12	1040	83.9	83.6	5.8	4.7	2.4	2.9	2.0	2.9	1.8	1.2	1.3	2.2	1.3	1.4	1.3	0.9
13	961	82.0	81.7	6.6	6.4	3.1	2.4	2.7	3.8	1.1	1.9	2.3	1.5	1.2	1.1	0.8	0.7
14	1027	81.9	81.6	6.6	6.2	2.6	3.9	2.0	2.6	2.0	1.8	2.4	1.5	1.2	1.5	1.2	0.7
15	802	77.7	78.7	7.2	7.8	3.0	2.6	3.1	2.4	3.2	2.7	2.0	2.4	1.9	1.7	1.9	1.6
16	430	75.6	77.4	10.7	9.3	2.8	2.5	4.6	3.0	3.0	3.0	1.6	1.8	0.7	0.7	0.9	2.1
17	267	74.5	72.3	9.0	7.5	2.2	6.7	5.2	3.0	2.2	2.2	4.1	3.4	1.1	1.5	1.5	3.4
18																	
19																	

Girls.

Age last Birthday.	Number Examined.	6		9		12		18		24		36		60		0	
		R.	L.	R.	L.	R.	L.	R.	L.	R.	L.	R.	L.	R.	L.	R.	L.
8	480	78.9	77.9	8.1	8.5	2.7	3.3	3.1	2.1	2.1	1.7	1.2	1.7	1.2	1.7	2.5	3.1
9																	
10																	
11																	
12	790	79.6	78.2	7.5	7.2	3.1	4.7	3.1	2.8	1.6	1.9	1.6	1.0	1.6	2.5	1.6	1.6
13	742	77.2	78.3	6.0	6.9	4.3	2.0	2.5	3.8	1.5	1.5	3.1	2.0	1.9	2.3	3.4	3.2
14	689	73.3	73.7	8.5	8.7	3.0	3.2	3.6	3.2	2.2	2.6	2.9	2.0	3.0	2.9	3.3	3.6
15	574	72.4	71.2	8.0	10.8	4.3	4.9	2.6	2.2	4.0	3.5	2.8	1.4	2.2	2.9	3.5	2.9
16	260	71.9	71.9	5.8	7.3	5.0	6.1	3.4	2.7	2.3	3.1	4.6	3.1	2.3	1.9	4.6	3.8
17	230	68.7	70.0	7.4	9.1	3.5	5.6	3.9	2.2	2.6	3.0	5.6	4.8	5.6	3.5	2.6	1.7
18																	
19																	

TECHNICAL AND CONTINUATION SCHOOLS.

The following table shows the results of the routine medical inspection of Technical and Continuation Schools —

		Boys.								Girls.							
		Ages 8-11.	Age 12.	Age 13.	Age 14.	Age 15.	Age 16.	Ages 17-19		Ages 8-11.	Age 12.	Age 13.	Age 14.	Age 15.	Age 16.	Ages 17-19	
Mental Condition.	No. Examined .....	...	14	95	175	165	74	15		...	...	5	105	146	4	1	
	Pupils having Defects.....	...	35.7	45.3	40.0	50.3	44.6	66.7		...	...	20.0	65.7	69.2	75.0	100.0	
	Dull and Backward	T	...	...	...	...	...	...		...	...	...	...	...	...	...
	Feeble-minded	T	...	...	...	...	...	...		...	...	...	...	...	...	...
	Imbeciles	T	...	...	...	...	...	...		...	...	...	...	...	...	...
	Idiots	T	...	...	...	...	...	...		...	...	...	...	...	...	...
	Malnutrition	T	...	...	...	...	...	...		...	...	...	...	...	...	...
		O	...	...	1.0	...	...	...		...	...	...	...	...	...	...
	Head	T	...	...	...	...	...	...		...	...	...	...	...	...	...
	Body	T	...	...	...	...	...	...		...	...	...	5.7	2.7	...	...
Uncleanliness.		O	...	...	...	0.6	...	...		...	...	...	...	...	...	...

TREATMENT.

In the vast majority of cases treatment is obtained privately, but the facilities which are available for the children attending the Elementary Schools are actually available for Secondary School pupils whose parents are not in a position to obtain the necessary treatment elsewhere. For necessitous non-residents in the County a note from the Medical Inspector or Head Master to the local Medical Officer of Health procures a ready response. The help of Head Teachers has been greatly appreciated in this direction.

The following tables show in summary form the amount, kind, and results of the treatment obtained during the year.

The first set of tables gives this information in regard to those pupils who were examined at the previous medical inspection ("new cases") :—

SECONDARY SCHOOLS.

TREATMENT OF DEFECTS.

NEW CASES.

Boys.

DISEASE OR DEFECT.	NUMBER OF PUPILS.							
	Re-ferred for Treat-ment.	Treated.			Result.			No Infor-mation.
		Under Autho- rity's Scheme.	Other- wise.	Total.	Cured.	Im- proved.	Un- changed	
1	2	3	4	5	6	7	8	
Minor Ailments (Skin)—								
Ringworm—Scalp ...	...	...	...	...	...	...	...	...
Ringworm—Body ...	...	...	...	...	...	...	...	...
Scabies ...	...	...	...	...	...	...	...	...
Impetigo ...	2	...	2	2	1	...	1	...
Minor Injuries ...	...	...	...	...	...	...	...	...
Other Skin Disease ...	32	...	15	15	11	2	2	17
Ear Disease ...	36	6	19	25	11	12	2	11
Eye Disease (external and other)	15	1	9	10	8	1	1	5
Dental Disease ...	353	7	194	201	122	71	8	152
Other Diseases ...	...	...	...	...	...	...	...	...

Girls.

DISEASE OR DEFECT.	NUMBER OF PUPILS.							
	Re-ferred for Treat-ment.	Treated.			Result.			No Infor- mation.
		Under Autho- rity's Scheme.	Other- wise.	Total.	Cured.	Im- proved.	Un- changed	
1	2	3	4	5	6	7	8	
Minor Ailments (Skin)—								
Ringworm—Scalp ...	...	...	...	...	...	...	...	...
Ringworm—Body ...	2	...	2	2	2	...	...	...
Scabies ...	...	...	...	...	...	...	...	...
Impetigo ...	1	...	1	1	1	...	...	...
Minor Injuries ...	...	...	...	...	...	...	...	...
Other Skin Disease ...	16	...	12	12	7	5	...	4
Ear Disease ...	40	1	25	26	6	11	9	14
Eye Disease (external and other)	8	...	6	6	5	...	1	2
Dental Disease ...	398	2	200	202	59	140	3	196
Other Diseases ...	177	3	109	112	53	47	12	65

TREATMENT OF VISUAL DEFECT.

NUMBER OF PUPILS.													
	Referred for Refrac-tion.	Submitted to Refraction.				For whom Glasses were Prescribed.		For whom Glasses were Obtained.		Recom-mended for Treat-ment other than by Glasses.	Received other forms of Treat-ment.	For whom no Treat-ment was considered necessary.	No Informa-tion.
		Under Author-ity's Scheme—Clinic, or Hospital.	By Private Prac-titioner or Hospital.	Other-wise.	Total.	Under Author-ity's Scheme.	Other-wise.	Under Author-ity's Scheme.	Other-wise.				
Boys	233	28	74	57	159	27	124	27	116	1	1	7	74
Girls	330	47	116	64	227	40	159	24	157	7	7	21	103

TREATMENT OF DEFECTS OF NOSE AND THROAT.

NUMBER OF PUPILS.						
	Referred for Treatment.	Received Operative Treatment.			Received other forms of Treatment.	No Information.
		Under Authority's Scheme—Clinic or Hospital.	By Private Practitioner or Hospital.	Total.		
Boys	64	7	18	25	5	34
Girls	167	9	23	32	50	85

TECHNICAL AND CONTINUATION SCHOOLS.

TREATMENT OF DEFECTS.

NEW CASES.

Boys.

DISEASE OR DEFECT.	NUMBER OF PUPILS.							
	Referred for Treat- ment.	Treated.			Result.			No Infor- mation.
		Under Autho- rity's Scheme.	Other- wise.	Total.	Cured.	Im- proved.	Un- changed	
1	2	3	4	5	6	7	8	
Minor Ailments (Skin)—								
Ringworm—Scalp ...	...	...	...	...	...	...	...	...
Ringworm—Body ...	...	...	...	...	...	...	...	...
Scabies ...	...	...	...	...	...	...	...	...
Impetigo ...	...	...	...	...	...	...	...	...
Minor Injuries ...	...	...	...	...	...	...	...	...
Other Skin Disease ...	...	...	...	...	...	...	...	...
Ear Disease ...	5	...	3	3	1	1	1	2
Eye Disease (external and other)	3	...	1	1	...	1	...	2
Dental Disease ...	46	...	9	9	3	6	...	37
Other Diseases ...	18	3	7	10	7	2	1	8

Girls.

DISEASE OR DEFECT.	NUMBER OF PUPILS.							
	Re-ferred for Treat-ment.	Treated.			Result.			No Infor-mation.
		Under Autho-rity's Scheme	Other-wise.	Total.	Cured.	Im-proved.	Un-changed	
	1	2	3	4	5	6	7	8
Minor Ailments (Skin)—								
Ringworm—Scalp ...	...	...	...	...	...	...	...	...
Ringworm—Body ...	1	...	...	...	...	...	...	1
Scabies ...	1	...	...	...	...	...	...	1
Impetigo ...	...	...	...	...	...	...	...	...
Minor Injuries ...	...	...	...	...	...	...	...	...
Other Skin Disease ...	3	...	1	1	...	1	...	2
Ear Disease ...	4	...	1	1	...	1	...	3
Eye Disease (external and other)	1	...	...	...	...	...	...	1
Dental Disease ...	38	5	5	10	9	1	...	28
Other Diseases ...	14	...	11	11	2	8	1	3

TREATMENT OF VISUAL DEFECT.

	NUMBER OF PUPILS.												
	Referred for Refraction.	Submitted to Refraction.				For whom Glasses were Pre-scribed.		For whom Glasses were Obtained.		Recom-mended for Treat-ment other than by Glasses.	Received other forms of Treat-ment.	For whom no Treat-ment was considered necessary.	No Infor-mation.
		Under Authority's Scheme—Clinic or Hospital.	By Private Prac-titioner or Hospital.	Other-wise.	Total.	Under Author-ity's Scheme.	Other-wise.	Under Author-ity's Scheme.	Other-wise.				
Boys	24	6	3	1	10	6	4	6	4	...	...	...	14
Girls	13	5	...	...	5	5	...	5	...	...	...	...	8

TREATMENT OF DEFECTS OF NOSE AND THROAT.

	NUMBER OF PUPILS.					
	Referred for Treatment.	Received Operative Treatment.			Received other forms of Treatment.	No Information.
		Under Authority's Scheme—Clinic or Hospital.	By Private Practitioner or Hospital.	Total.		
Boys	15	4	1	5	4	6
Girls	14	5	1	6	2	6

The following set of tables gives similar information in regard to those pupils who were recommended to obtain treatment at some inspection prior to the last ("old cases") :—

SECONDARY SCHOOLS.

TREATMENT OF DEFECTS.

OLD CASES.

Boys.

DISEASE OR DEFECT.	NUMBER OF PUPILS.							
	Re-ferred for Treat- ment.	Treated.			Result.			No infor- mation.
		Under Autho- rity's Scheme.	Other- wise.	Total.	Cured.	Im- proved.	Un- changed	
1	2	3	4	5	6	7	8	
Minor Ailments (Skin)—								
Ringworm—Scalp ...	...	...	...	...	...	...	...	...
Ringworm—Body ...	...	...	...	...	...	...	...	...
Scabies ...	1	...	1	1	1	...	...	...
Impetigo ...	2	...	2	2	2	...	...	...
Minor Injuries ...	...	...	...	...	...	...	...	...
Other Skin Disease ...	12	...	5	5	3	1	1	7
Ear Disease ...	34	2	15	17	15	...	2	17
Eye Disease (external and other)	9	...	6	6	3	3	...	3
Dental Disease ...	95	...	50	50	16	33	1	45
Other Diseases ...	20	2	9	11	2	4	5	9

Girls.

DISEASE OR DEFECT.	NUMBER OF PUPILS.							
	Re-ferred for Treat-ment.	Treated.			Result.			No Inform-ation.
		Under Autho- rity's Scheme.	Other- wise.	Total.	Cured.	Im- proved.	Un- changed	
1	2	3	4	5	6	7	8	
Minor Ailments (Skin)—								
Ringworm—Scalp ...	...	...	...	...	...	...	...	...
Ringworm—Body ...	...	...	...	...	...	...	...	...
Scabies ...	...	...	...	...	...	...	...	...
Impetigo ...	...	...	...	...	...	...	...	...
Minor Injuries ...	...	...	...	...	...	...	...	...
Other Skin Disease ...	1	...	1	1	1	...	...	...
Ear Disease ...	4	...	...	...	...	...	3	1
Eye Disease (external and other)	...	...	...	...	...	...	...	...
Dental Disease ...	57	1	28	29	12	15	2	28
Other Diseases ...	9	...	6	6	2	3	1	3

TREATMENT OF VISUAL DEFECTS.

NUMBER OF PUPILS.														
	Referred for Refraction.	Submitted to Refraction.				For whom Glasses were Prescribed.		For whom Glasses were Obtained.		Recommended for Treatment other than by Glasses.	Received other forms of Treatment.	For whom no Treatment was considered necessary.	No Information.	
		Under Authority's Scheme—Clinic or Hospital.	By Private Practitioner or Hospital.	Other-wise.	Total.	Under Authority's Scheme.	Other-wise.	Under Authority's Scheme.	Other-wise.					
Boys	45	2	9	22	33	2	31	2	22	...	...	12	...
Girls	23	3	8	6	17	3	13	3	13	...	1	...	6	

TREATMENT OF DEFECTS OF NOSE AND THROAT.

NUMBER OF PUPILS.						
	Referred for Treatment.	Received Operative Treatment.			Received other forms of Treatment.	No Information.
		Under Authority's Scheme—Clinic or Hospital.	By Private Practitioner or Hospital.	Total.		
Boys	18	...	5	5	13	...
Girls	30	4	5	9	12	9

TECHNICAL AND CONTINUATION SCHOOLS.

TREATMENT OF DEFECTS.

OLD CASES.

Boys.

DISEASE OR DEFECT.	NUMBER OF PUPILS.							
	Referred for Treat- ment.	Treated.			Result.			No Infor- mation.
		Under Autho- rity's Scheme.	Other- wise.	Total.	Cured.	Im- proved.	Un- changed	
1	2	3	4	5	6	7	8	
Minor Ailments (Skin)—								
Ringworm—Scalp ...	...	...	...	...	...	...	...	...
Ringworm—Body ...	...	...	...	...	...	...	...	...
Scabies ...	...	...	...	...	...	...	...	...
Impetigo ...	...	...	...	...	...	...	...	...
Minor Injuries ...	...	...	...	...	...	...	...	...
Other Skin Disease ...	...	...	...	...	...	...	...	...
Ear Disease ...	2	...	...	...	...	...	1	1
Eye Disease (external and other)	...	...	...	...	...	...	...	...
Dental Disease ...	5	...	...	...	...	...	2	3
Other Diseases ...	2	...	...	...	...	...	...	2

Girls.

DISEASE OR DEFECT.	NUMBER OF PUPILS.							
	Re-ferred for Treat-ment.	Treated.			Result.			No Infor-mation.
		Under Autho-rity's Scheme.	Other-wise.	Total.	Cured.	Im-proved.	Un-changed	
	1	2	3	4	5	6	7	8
Minor Ailments (Skin)—								
Ringworm—Scalp ...	...	...	...	...	...	...	...	...
Ringworm—Body ...	...	...	...	...	...	...	...	...
Scabies ...	...	...	...	...	...	...	...	...
Impetigo ...	...	...	...	...	...	...	...	...
Minor Injuries ...	...	...	...	...	...	...	...	...
Other Skin Disease ...	...	...	...	...	...	...	...	...
Ear Disease ...	1	...	...	...	...	...	...	1
Eye Disease (external and other)	...	...	...	...	...	...	...	...
Dental Disease ...	5	...	...	...	...	...	...	5
Other Diseases ...	3	...	3	3	...	3	...	...

TREATMENT OF VISUAL DEFECT.

NUMBER OF PUPILS.														
	Referred for Refraction.	Submitted to Refraction.				For whom Glasses were Prescribed.		For whom Glasses were Obtained.		Recommended for Treatment other than by Glasses.	Received other forms of Treatment.	For whom no Treatment was considered necessary.	No Information.	
		Under Authority's Scheme—Clinic or Hospital.	By Private Practitioner or Hospital.	Other-wise.	Total.	Under Authority's Scheme.	Other-wise.	Under Authority's Scheme.	Other-wise.					
Boys	2	...	...	...	...	...	...	...	...	...	...	...	2
Girls	3	...	...	...	...	...	...	...	...	...	...	...	3

TREATMENT OF DEFECTS OF NOSE AND THROAT.

NUMBER OF PUPILS.						
	Referred for Treatment.	Received Operative Treatment.			Received other forms of Treatment.	No Information.
		Under Authority's Scheme—Clinic or Hospital.	By Private Practitioner or Hospital.	Total.		
Boys	3	...	...	...	...	3
Girls	...	...	...	...	...	...

EMPLOYMENT OF CHILDREN AND YOUNG PERSONS.

The formal arrangements remain as described in previous Reports. A considerable number of children have been examined for the purpose of employment. The following brief statement is supplied by the courtesy of the Elementary Department :—

Number of cases of suspected illegal employment dealt with by School							
Attendance Officers ...	...	...	...	...	...	...	710
Number of cases reported ...	...	...	...	...	...	...	73
Number of prosecutions ...	...	...	...	...	...	...	1

The following figures show the number of boys and girls of school age registered for employment before and after school hours, and the occupation in which they are engaged ; also the number of boys between 15 and 16 years of age who are in possession of badges for street trading and the nature of such trading :—

Total number of children employed before and after school hours—

Boys, 1,230 ; Girls, 88.

Occupations—

(a) Errands for grocers ...	...	...	...	...	...	...	133
(b) Errands for greengrocers ...	...	...	...	...	...	...	42
(c) Milk delivery ...	...	...	...	...	...	...	310
(d) Newspaper delivery ...	...	...	...	...	...	...	759
(e) Other occupations ...	...	...	...	...	...	...	74

Street Trading—

Total number of boys between 15 and 16 years of age engaged in Street Trading	49
---	-----	-----	-----	-----	-----	-----	----

Occupations—

(a) Newspaper selling ...	...	...	...	...	...	...	47
(b) Hawking ...	...	...	...	...	...	...	2

Four formal notifications of the employment of children in theatrical performances have been received during the year, representing five children. In these cases the theatres and places of residence were visited by the Superintendent of School Attendance Officers and everything found satisfactory.

Four applications for licences to employ children in theatrical entertainments were granted ; three licences issued previously were renewed for a further period.

The Adoption of Children Act, 1926, came into operation on the 1st January, 1927. This Act provides a means of giving the child by adoption a proper legal status, and of imposing on its adopted parents full parental responsibilities and conferring on them full parental rights. It is already evident that the benefits of the Act will be freely sought after, and that they will be a particular advantage to illegitimate children, many of whom have in fact though not in law, been already adopted by people who had no children of their own.

The Education Committee have agreed to act as guardian *ad litem* when asked to do so by the County Court or Local Magistrates.

During the year 38 applications have been made. In all these cases investigations are made by the Superintendent of School Attendance Officers personally, and at the hearing of the cases the Superintendent appears to give a report and recommendation. In all cases the recommendation of the Superintendent has been acted upon. It is pleasing to hear expressions of appreciation and acknowledgment of the services of the Education Committee and the manner in which inquiries have been made on their behalf.

MISCELLANEOUS.

Special attention is directed to the examination of Bursars in Secondary Schools. During the past year 343 Bursars were examined, and, in addition, 136 candidates for Bursaries were examined.

A number of lectures, in many cases arranged in conjunction with Miss Tipper, the organising lecturer employed by the Public Health Department, have been given to parents, mothers, members of Women's Institutes, Mothers' Unions, &c., during the year.

Lectures, illustrated by suitable films and lantern slides, have been given by members of the School Medical and Dental Staff, and Miss Tipper, to large numbers of children on such subjects as Personal Hygiene, Cleanliness, Care of the Teeth, &c., in many of the districts.

Various courses of lectures to Midwives have been given by members of the Medical Staff.

During the past four years a series of lectures on professional and technical subjects relating to their work have been delivered to the Nursing Staff by the Medical Staff. Attendance at these lectures, which are held once a month, is compulsory. The subjects dealt with have been :—

Legal Enactments dealing with Maternity and Child						
Welfare and School Medical work	...	...	...	...	...	Dr. Ferguson.
Vital Statistics	...	...	...	...	...	Dr. Scholefield.
Ante-Natal Hygiene	...	...	...	...	...	Dr. Hall.
Ophthalmia Neonatorum and other Eye Complaints of						
Infancy	...	...	...	...	...	Dr. Wray.
Hygiene of Infancy and Childhood	...	...	...	...	...	Dr. Wray.
Clothing of Infants and Children	...	...	...	...	...	Dr. Corbett.
Orthopædics	...	...	...	...	...	Dr. Tomb.
Infant Feeding	...	...	...	...	...	Dr. Wright.
Milk	...	...	...	...	...	Dr. Wright.
Epidemiology and some Infectious Diseases	...	...	...	...	...	Dr. Wright.
The Delicate Child	...	...	...	...	...	Dr. Porter.
Maternal Mortality and Puerperal Infection...	...	...	...	...	...	Dr. Fisher.
The Teeth	...	...	...	...	...	Dr. Kershaw.

SPECIAL INQUIRIES.

Dr. G. G. Wray has made an investigation into the Etiology of Defective Vision caused by Errors of Refraction.

(M.D. Thesis for Edinburgh University. Published by permission of the University.)

AN INVESTIGATION INTO THE ETIOLOGY OF DEFECTIVE VISION CAUSED BY ERRORS OF REFRACTION.

The publication in Germany, in the year 1883, of Cohn's "Hygiene of the Eye" brought into prominence the necessity of testing the vision of school children.

Since that date and principally owing to the figures which Cohn showed and the conclusions he based upon them, the subject has received a large amount of attention in all countries. It was not, however, until the year 1908, when a system of Medical Inspection of school children was first established in this country, that any attempt was made in England to obtain information on a large scale on this important subject. Before this date, information could only be obtained from the results recorded in other countries, notably Germany and the United States of America. These results, whilst no doubt giving a reliable index of the percentage of visual defect found amongst the school children of the country from which the report emanated, could not with equal scientific accuracy be so applied to the school children of the British Isles. For instance, the percentage of Myopia found amongst German children is much higher than is found in this country.

Almost the only source of information previous to 1908 with regard to this subject in England was derived from reports on the examination of Industrial Schools and Institutions of a similar nature. Such information, in view of the comparatively small numbers involved, was quite unreliable when applied to the children of the country as a whole.

The Annual Reports of School Medical Officers and the Chief Medical Officer of the Board of Education have, however, yielded much information on the subject and stimulated interest in the matter.

Statistics are now available showing the numbers and percentages of children who exhibit defective vision. Many books and articles have been written on the subject, and much work of a research nature has been undertaken.

Some idea of the amount of defective vision existing amongst school children may now be given by quoting extracts from books and annual reports.

Kerr, writing in "Newsholme's School Hygiene" states, that the percentage of defective vision is higher in girls than in boys, and younger children exhibit a higher percentage than those older. He also gives figures of tests carried out at Bradford. In the first series of tests, 39,118 children were examined, and the percentage falling

short of normal vision was progressively less, from 43 per cent. at age 7, to 9 per cent. at age 14. In the second series of tests, 7,755 girls and 7,787 boys were examined. The boys showed vision less than normal in 44 per cent. of cases at the age of 7, and a gradually lessening percentage up to the age of 13 when the percentage was 16.5. In girls, at the age of 7, 50 per cent. had visual acuity less than normal, and at age 14, 18 per cent. only were deficient. He further states that 10 per cent. had vision as bad as 6/18, and that this is a constant throughout school life. Visual acuity of 6/36 or worse is in increasing proportion, from 1.5 per cent. at age 7 to 3.5 per cent. at age 14.

The Annual Report of the Medical Superintendent of Schools, Lancashire, for 1910 shows that 9,926 boys and 10,037 girls at the age of 12 years were subjected to a test of vision. Of the boys, 86 per cent. had normal vision, and 14 per cent. were less than normal. The girls showed 83.5 per cent. normal vision and 16.5 per cent. less than normal.

These tests were carried on through the years 1911, 1912, 1913, and 1914, and in his Annual Report for the latter year, the Medical Superintendent gives a further analysis of the vision tests for children aged 12, 13, and 14. Altogether 43,994 boys and 44,630 girls were tested. The boys showed 84.1 per cent. of good vision and the girls 80.6 per cent. (Good vision was arbitrarily fixed as those who saw 6/6 or 6/9 with each eye.) The respective percentages of defective vision were 15.9 in the boys and 19.4 in the girls. At the same ages and with the same figures as above, the percentage of those who saw 6/6 with each eye was 73.4 in the case of the boys and 67.1 of the girls; so that 26.6 per cent. of the boys and 32.9 per cent. of the girls had visual acuity less than normal.

Cohn in his "Hygiene of the Eye" states that he examined the eyes of 1,486 children attending rural schools and of 8,574 children attending urban schools, a total of 10,060, and found that 83 per cent. were emmetropic. Thirteen per cent. showed refractive errors, and 4 per cent. suffered from other diseases of the eye.

Bishop Harman, in his "The Eyes of our Children," states that in an examination of 341 boys and 328 girls, the latter had 26 per cent. of faulty vision and the former 18 per cent.

Dr. S. D. Risley, writing in Norris & Oliver "System of Diseases of the Eye" on School Hygiene, gives some statistics from America. He states that in school statistics the following relation was shown:—

Emmetropia	...	...	...	...	11.19 per cent.
Hypermetropia and Hypermetropic Astigmatism	...	...	...	...	74.04 per cent.
Myopia and Myopic Astigmatism	...	...	...	...	13.7 per cent.
Mixed Astigmatism	...	...	...	...	12.09 per cent.

The quotations given above show the conditions which exist amongst the school children in England, Germany, and the United States of America.

In each country the percentage of visual defect is sufficiently large to warrant strong measures being taken to combat the serious effects which such defects have on the educational efficiency and the industrial life of the country.

In Lancashire the well being of the people is largely dependent on the cotton industry. A large proportion of the children attending Lancashire schools subsequently enter cotton factories. Cotton work demands efficient eyesight and workers with defective sight prove but poor workmen where the defect is uncorrected.

It was with such facts in view that this investigation was undertaken. It was an attempt to obtain some information of the factors governing and affecting defective vision in school children.

The enquiry was conducted partly during the course of routine medical inspection of schools and partly by special visits to the schools for the purpose.

The first part of the investigation was started during the years 1913 and 1914, but unfortunately this part was interfered with by the advent of the European War, with the result that the information collected was incomplete. This part was especially devoted to the influence of heredity on the causation of defective vision, and as at the termination of the war the children examined had left school, it was found impossible to complete the figures. The result is that only those numbers which were more or less completed before the interruption are given.

Since the end of the war, the investigation has been continued, but with different schools and different children. In these latter parts of the enquiry other factors have been considered which might have an influence on the etiology of visual defect.

At this point it must be clearly stated that visual defects caused by mental Disease or Eye Disease, other than errors of refraction, are not included in this enquiry.

The investigation only comprises defective vision caused by hypermetropic, myopic, and astigmatic defects.

THE COMPILATION OF THE INVESTIGATION.

For the sake of compactness, the defects have been collected into three groups :— Hypermetropia, Myopia and Mixed Astigmatism. It was also felt that all the elements of each group were probably influenced in the same way by each factor considered.

The Hypermetropic group comprises Hypermetropia, Hypermetropic Astigmatism, and Compound Hypermetropic Astigmatism.

The Myopic group includes Myopia, Myopic Astigmatism and Compound Myopic Astigmatism.

The Mixed Astigmatism group consists of Mixed Astigmatism and a few cases of Anisometropia.

The visual defects are thus divided into those caused by :—

1. The short eye;
2. The long eye; and
3. The irregular eye.

It has already been stated above that the investigation does not show a continuity of children and schools; in consequence several sets or series of figures are dealt with, and it has been found more convenient to consider each group of defects under the heading of the factor concerned rather than to consider each group of defects separately.

This makes for greater ease of annotation, requires fewer tables of results, and gives greater clearness in comparison between the respective groups of defects. Thus under the factor “ Heredity ” are considered the respective groups Hypermetropia, Myopia and Mixed Astigmatism.

After all the factors have been considered and the results given of the influence each factor has borne on the various groups of defects, a short resumé with conclusions based on the results found is annotated for each group of defects separately.

A list is given below of the factors investigated as being likely to have some effect on the etiology of defective sight.

The factors are as follows :—

- (a) The influence of Heredity.
- (b) The Age influence.
- (c) The influence of Sex.
- (d) The influence of the Lighting of Schools.
- (e) The influence of Environment.
- (f) The influence of Consanguinity.
- (g) The Racial influence.

Before taking the factors seriatim, a short account is given of the general methods of procedure pursued in testing the vision of the school children and the method of diagnosing the actual errors of refraction. The more particular methods are described under their respective sections.

METHODS OF PROCEDURE.

Each child examined was tested first of all by Snellen's Test Type at the required distance of 6 metres in a good light.

Each eye of every child was tested separately and the results noted. All children who did not see 6/6 with each eye were marked down for further examination. Besides these, all children who read 6/6 with each eye but who exhibited signs of Eye Strain, Conjunctivitis or Blepharitis were also put on the list for further examination. By this means, all or practically all those children who had latent defects, as well as those who had manifest defects, were subjected to further examination.

The further examination consisted of examining the children by means of the Ophthalmoscope for signs of fundal or other diseases and then subjecting them to a retinoscopic test.

The examination by means of the ophthalmoscope was performed in a room which was specially darkened for the purpose. So far as possible a room was chosen which was over twelve feet in length.

The illuminant used was an ordinary wax candle in order that too powerful a light should not be given and thus cause pupillary contraction.

In view of the large number of children examined it was not found possible to use a mydriatic as a routine measure. The large number examined was not the only difficulty encountered in the use of a mydriatic. The parents' consent had first to be obtained and as many of the children's homes were long distances from the school this was extremely difficult to obtain.

The method of performing the retinoscopic examination with an undilated pupil was as follows:—The child was instructed to look at some object on the wall at a level just above the examiner's head, the wall most distant from the candle being chosen for this purpose. By this means a very considerable degree of relaxation of accommodation was achieved. The results thus found were in many cases afterwards confirmed by the use of mydriatics and in others by testing the eyesight with trial lenses. It was found that quite a reasonable degree of accuracy was attained by this method.

As a further precaution all errors of refraction of less than one dioptré of myopia or hypermetropia were rejected and only those children exhibiting one dioptré or more of error were annotated.

The somewhat feeble illuminant was a great help in not causing pupillary contraction.

Children under the age of six were not examined in connection with this investigation as they are quite unreliable in Snellen's test and are very difficult to examine by means of a retinoscope without mydriasis. The errors of refraction found were classified into the three groups already described above.

The ages of the children varied from six to thirteen and both boys and girls are included except where it is otherwise stated.

The first factor investigated was:—

(a) *The Influence of Heredity.*

Oculists in all countries have enquired into and written about this as an etiological factor of visual defect. The majority of them agree that in the case of Myopia, if heredity is not the actual cause, at least it is a very strong predisposing one; whilst some of them have been of the opinion that Myopia is always hereditary.

In the case of Hypermetropia, the opinions given are much more guarded, for although most text books state that Hypermetropia is practically always congenital, only a minority of them express any opinion as to the influence of heredity.

Mixed Astigmatism is generally dismissed in a few sentences and no description is, as a rule, given of its etiology.

During the course of the investigation into the hereditary factor, some 3,000 children in all were examined. Of these, 867 were subjected to further Ophthalmoscopic and retinoscopic examination and those who were found to be emmetropic and others who exhibited an error of less than one dioptré were discarded for the purpose of this enquiry. Thus, out of the 867 children a certain number remained who were suitable subjects for the purpose of further particulars and enquiries. (It might be stated here that children wearing glasses already had exactly the same routine examination as the others and are included in the numbers given.)

Of the numbers remaining after the eliminations, one child out of each family, where more than one had been examined, was chosen, and further enquiries were devoted to the family history of this child with regard to the question of the defective sight.

The number of families thus enquired into was 432. This number must not, however, be taken as an index of the number of children exhibiting refractive errors of over one dioptré, but is simply the number of those into whose family history it was possible to enquire. There were many others whose family history would have been enquired into, had it been possible to complete this part of the investigation.

The acquirement of information on the questions of the hereditary influence and of the family history generally, presented difficulties of great magnitude when undertaken during the course of medical inspection of schools.

The schools in which the examinations were performed were scattered over a large area of Lancashire and included rural as well as urban schools. This greatly increased the difficulty of obtaining the information desired, as it was necessary, in order to get reliable information, to see the parents of the children.

Where both parents went out to work, it was found difficult to get in touch with them.

In this part of the investigation, the help of the School Nurses was enlisted, and they were supplied with the details of each case and a list of the information desired.

It was not found possible to test the vision of the parents of the children, as this was outside the work and sphere of a School Medical Officer. It was realized that this was the only manner in which scientific accuracy could be obtained, but the difficulties proved insuperable.

The ideal being unattainable, the method of obtaining the evidence of defective sight or otherwise of the parents was as follows:—Information was obtained from each parent as to whether he or she had ever worn glasses, and also whether these had been worn for near or distant vision. If glasses were only worn for near vision, and the person concerned was over 40 years of age, such was not accepted as showing evidence of defective sight. Presbyopia was thus excluded.

Where glasses were not worn an attempt was made to obtain evidence from the parents concerned as to the state of their vision. The evidence obtained was of doubtful value, as it was found that people of limited education were seldom conscious of visual defect where it existed. Where the parents admitted visual defect it was found to be generally reliable information. The evidence, therefore, is not conclusive in the case of those children whose parents gave no history of defective sight, as probably a large number of them had defects of which they were unaware. A certain number of parents also gave wrong information in order to discredit the evidence that their child required glasses.

Where the evidence was positive it could be relied upon, as working people are extremely averse to the wearing of glasses unless the need is very great.

Along with the history of defective sight amongst the parents, information was obtained of the evidence of defective sight or otherwise of brothers or sisters of each child enumerated. This will be afterwards called the "Familial Influence."

It has already been mentioned above that in certain cases more than one member of a family was examined at school. The "Familial Influence" whilst not strictly coming under the influence of heredity is considered here, as it is probably closely related to the question of heredity.

Each group of defects will now be considered separately in relation to the governing factor—Heredity.

The first to be considered is hypermetropia and its allied astigmatism grouped under the term

Hypermetropia.

It has been stated above that the opinions of standard authorities are somewhat at variance on the question as to the part that heredity plays in the etiology of hypermetropia.

Some of these opinions are now given.

Swanzy and Wernher, in their manual "Diseases of the Eye," express the opinion that children are hypermetropic at birth, but become less so as the eye develops. They also state that the eyes of uncivilised nations are hypermetropic.

Bishop Harman, in "The Eyes of our Children," does not discuss at all the hereditary influence on this condition, but states it is often congenital.

Cohn, in "The Hygiene of the Eye," states that hypermetropia is almost always congenital and often hereditary. He gives, however, no figures to support his view.

Risley, in Norris and Oliver's "System of Diseases of the Eye," expresses no opinion as to the influence of heredity on pure hypermetropia, but is of the opinion that astigmatism is inherited.

These quotations are sufficient to show that opinion is divided on this subject.

Before proceeding to discuss the results of the enquiry, a short account of the percentage of visual defect, due to hypermetropia is annotated. In this country the percentage of defect due to hypermetropia is usually considerably greater than that due to myopia, the reverse of that found by Cohn in Germany. The relative percentages, as found by Dr. Jones in an investigation in Lancashire schools, were of hypermetropia 13·6 per cent. in boys and 13·1 in girls, as opposed to 2·3 per cent. and 4·0 per cent. respectively in the case of myopia.

The results of the present investigation are now given below, with an explanation of the method of tabulation.

Of the 432 cases inquired into, 282 were found to be affected by hypermetropia and its allied astigmatism. This gives a percentage of 68·3. The percentage is purely an arbitrary one and not actual. It is only a percentage of the cases fully investigated.

A table is given below of these 282 cases, analysing the results found in the enquiry into the family histories. An explanation must first be given of the headings of the table in order to give greater clearness. Where the father of the child gave evidence of defective sight, the case is entered under the heading "Father affected." Similarly for the mother.

Where both father and mother were affected, the case is entered under "Mother and father affected."

Columns are also given of the cases where the father and other children in the family were affected, and similarly also for where the mother and other children of the family were affected, and where both parents and other children were affected.

The next column gives those cases where the parents gave no history of defective sight, but where brothers or sisters were affected.

The last column gives the cases where no history was obtained of visual defect in any other members of the family.

The numbers of cases are given in each column and below the numbers the percentages :—

	1	2	3	4	5	6	7	8
	Father affected.	Mother affected.	Mother and father affected.	Father and other children.	Mother and other children.	Mother & Father & other children.	Other children affected.	None in family.
Number	19	50	11	11	27	6	84	118
Per cent.	6·7	17·7	3·9	3·9	9·5	2·1	29·7	41·8

The figures in columns 4, 5 and 6 are part of and included in columns 1, 2 and 3, consequently it will be noticed that the numbers total more than 282 and the percentages to more than 100.

Columns 1, 2 and 3 are entirely separate cases and if they are added together it will be found that 80 cases out of 282 or 28·3 per cent. give a history of hereditary influence.

This figure can only be considered as a minimum one for the reason stated above in the methods of obtaining information. If it had been possible to examine the eyesight of all the parents a very much higher percentage of defective sight amongst them would undoubtedly have been found.

It must again be pointed out that the cause of the parent's defective sight is not separated in this inquiry into the groups of refraction errors as in the case of the children, so that it is possible for a child affected by hypermetropia to have a myopic parent. It was not found possible to find out definitely the parents errors for the reasons stated earlier in this paper. Cases of defective vision due to accident, corneal opacities, cataract and fundal disease were excluded so far as possible.

Had this part of the enquiry not been so summarily interrupted, an attempt would have been made to obtain more exact information of the underlying cause of the parents visual defect.

If columns 1, 2, 3 and 7 be added together, some idea may be obtained of the familial predisposition to this defect. The actual numbers are 164 and the percentage of the total suffering from hypermetropia is 58. In connection with this predisposition it was found comparatively frequently during the investigation that all children in the family were not affected, even where one or other or both parents were affected. Children examined in such families were found to be emmetropic whilst others were hypermetropic. In some instances one child was found to be hypermetropic whilst a brother or sister was found to be myopic or to have mixed astigmatism.

It is interesting to note that the cases where the mother alone was affected exceeded those where the father alone was affected; a percentage of 17·7 as opposed to 6·7 per cent. This also is found to be true of the columns where mother and other children affected are noted and father and other children affected are noted. The respective percentages are 9·5 and 3·9.

From these figures, it appears that the maternal hereditary influence is greater than the paternal. It is not quite clear why this is so. It may be accounted for by the greater proportion of defective sight found amongst the female sex and thus giving a larger number of mothers wearing glasses than fathers. It may also be accounted for by the fact that men, as a rule, object more strenuously to the wearing of glasses than women do. In this connection it has been found during the course of medical inspection of schools much easier to persuade parents to have treatment for their daughters eyes than for their sons.

Thus the greater maternal influence in heredity may be an accidental one in these figures or it may be actual. No more definite conclusion can be drawn without fuller details.

The number of cases found where both parents were affected is small with a percentage of 3·9 and still smaller where both parents and other members of the family are affected, 2·1 per cent. The smallness of these percentages may be accounted for by natural selection of mates and also be Nature's efforts to strike an average, thus preventing both parents being affected by defective sight in the majority of cases.

The largest number of cases showed no evidence of defective sight amongst the parents. This number can be obtained by adding together columns 7 and 8 and is 202 and the percentage is 71·6. Column 8 gives the cases where no familial predisposition could be found (41·8 per cent.). It has already been stated that both these percentages ought undoubtedly to be lower.

During the course of the investigation, one boy, the son of a head teacher of a school, was found to be suffering from Compound Hypermetropic Astigmatism and the teacher himself was so affected. The teacher volunteered the information that his father was also similarly affected. This gives a hereditary descent of the error through three generations in the male line.

The results as a whole do not give sufficient evidence (partly due to the paucity of numbers and partly to the incompleteness of the information obtained), to base a firm opinion as to the exact influence heredity has on the etiology of Hypermetropia.

The percentage (28·3) where the evidence obtained showed parental visual defect is undoubtedly much too low. It is considered that 40 to 50 per cent. would more probably represent somewhere about the true percentage.

It cannot be claimed from the results of this enquiry that hypermetropia is always hereditary in origin. The results do show, however, that heredity does play quite a considerable part in the etiology of this defect and that an abnormal eyeball in a parent has a tendency to be transmitted to the children.

It can also be concluded that certain families show a predisposition to develop hypermetropic defects and in this enquiry the predisposition was found to affect 58 per cent. of the families examined. It can also be concluded that on the whole the maternal hereditary influence is the stronger one.

The influence of Heredity on Myopic conditions has now to be considered.

Myopia.

Since Cohn first published his investigations into this condition, many investigators have followed in his footsteps in all countries.

The results published have been numerous and frequently contradictory.

Oculists have divided themselves into two opposing camps on the vexed question of the influence of heredity and this variance in opinion persists to the present day in spite of the numerous text books and articles on the subject.

In the British Medical Journal in the autumn of 1919 articles appeared from both camps and the subsequent discussion which arose only served to accentuate the doubt which shrouds this question.

Cohn gives figures which show that in an enquiry which he directed into this question, out of 1,004 myopic scholars only 2·7 per cent. had a myopic father or mother.

Erismann on the contrary found that myopia was inherited in 30 per cent. of all cases of myopia examined.

Donders states "My experience shows that myopia is almost always inherited and when inherited exists in the child at least in the form of a predisposing tendency."

Cohn's final opinion was that the question of heredity influence in myopia is not yet decided; that the transmission of the tendency to myopia is at least probable but that in many cases without any hereditary predisposition, myopia is developed by other causes.

Risley, in Norris and Oliver's "System of Diseases of the Eye," states that it is rare to find myopic children in families where both parents have normal eyes. He is of the opinion that congenital anomalies in the form of the eyeball are hereditary rather than the myopia itself or any tendency to myopia.

Bishop Harman in the "Eyes of our Children" states that some 3 per cent. of children are myopic, and gives figures which show that 17 per cent. of 300 children found myopic gave a definite family history of myopia. He considers that there may be an inherited predisposition to the stretching of the coats of the eyes.

Swanzy and Wernher in their text book "Diseases of the Eye" say that "Myopia is rarely congenital. It is almost wholly a result of civilisation and its development and increase are due to the use of the eye for near work. Heredity also plays a part which, however, is not quite clear, but it would seem that some anatomical or constitutional predisposition must be transmitted to the offspring."

Sufficient opinions have been given to show the variance in views which exist on the question of the influence of heredity on the etiology of myopia.

The results of this investigation are given in a table below. Out of the 432 children investigated on this question, 116 were found to be suffering from Myopia or Myopic Astigmatism (26·8 per cent.). This percentage as in the previous table is an arbitrary one and for the same reason.

In the table the same columns are used as in the previous table of Hypermetropic cases.

	1	2	3	4	5	6	7	8
	Father affected.	Mother affected.	Mother and father affected.	Father and other children.	Mother and other children.	Mother & Father & other children.	Other children affected.	None in family.
Number	11	26	6	3	10	4	23	50
Per cent.	9·4	22·4	5·1	2·5	8·6	3·4	19·8	43·1

The same remarks about the grouping of the figures in the columns and also the percentages apply here as in the previous table, *e.g.*, the numbers come to more than 116 and the percentage to over 100.

It is seen that columns 1, 2 and 3 all give higher percentages in this table than they did in the case of hypermetropia whilst the other columns, with the exception of column 6, give lower percentages.

If the figures in columns 1, 2 and 3 be added together, it is found that the figures and percentage are respectively 43 and 36·9. These columns give the percentage and number of cases where positive evidence was found of errors of refraction in one or other or both parents. In other words they give a measure of the hereditary influence. Actually then 36·9 per cent. of the cases investigated gave a history of defective sight in the parents.

This figure compares with the 30 per cent. found by Erismann in his cases but his figures refer only to cases where the parents were found myopic whereas the figures

in this investigation refer only to errors of refraction in parents which are not differentiated. Again it must be stated that this percentage (36.9) is too low and undoubtedly would have been much higher if fuller information could have been obtained. It is a minimum percentage.

It is a considerably higher percentage than was found in the case of hypermetropia (28.3).

It must not be concluded from this percentage that 36.9 per cent. of myopic parents, as in Erismann's cases, pass on their defect to their children, but that 36.9 per cent. of myopic children give a history of parental visual defect.

In these results it is also found that the maternal hereditary influence is stronger and more liable to be transmitted than the paternal. It was similarly so in the case of hypermetropia.

It is also seen that more cases of Myopia than of Hypermetropia are found amongst the children, where both parents have defective sight.

Where the mother or father is affected along with other children of the family, the percentage is less in the case of myopic children than in the case of hypermetropic, but where both parents are affected along with other children of the family the percentage is greater in the case of Myopia. Where other children in the family are affected (column 7), the percentage is found to be less than in the case of hypermetropia (19.8 as opposed to 29.7).

The familial predisposition can be obtained by adding up columns 1, 2, 3 and 7, and the percentage is found to be 56.7. This percentage is very similar to that found in the case of hypermetropia.

When examining the children it was found in certain cases that where a child was myopic its brothers or sisters were also usually myopic but in a small number of cases the brothers or sisters were hypermetropic or had mixed astigmatism and others were emmetropic.

During the course of the investigation, one family consisting of father, mother, and six children were all found to be myopic. The majority of them suffered from high and progressive myopia. The youngest child, aged five, had seven dioptries of myopia in each eye. All observers do, however, agree on this subject that cases of high or progressive myopia are always hereditary but it is rather unusual to find so many myopic subjects in one family.

Families where two or more cases of myopia were found were common.

It would be difficult on the figures given in the table to say that myopia is always hereditary, for the number examined is too small and the details of family history too incomplete to make such a sweeping conclusion. It can, however, be said from these figures that myopic children give a parental history of visual defect in about 40 per cent. of cases.

It can be deduced with even more scientific accuracy that the presence of an error of refraction in a parent is a predisposing influence to the development of myopia in the children in about 40 per cent. of cases.

The opinion is usually expressed in text books that babies are practically always hypermetropic. If this view be correct, and it is widely accepted, the predisposing influence just discussed cannot be said to produce myopia in very young children but rather some inherent weakness in the eyes which later on allows them to become myopic. This weakness may quite well be some lack of strength in the coats of the eyeball. It can be compared to somewhat analogous conditions found in the case of Hernia and Varicose Veins.

Mixed Astigmatism.

This is the least commonly found of all errors of refraction in children and in consequence, manuals on School Hygiene either do not mention it or dismiss it in a very few sentences. No statistics are given on the subject nor any opinion on its etiology.

Risley in Norris and Oliver's text book states that "Mixed Astigmatism is more common than usually suspected. Cases examined without the aid of a mydriatic and thought to be Myopic Astigmatism were found under atropine to be cases of Mixed Astigmatism." He is of the opinion that mixed astigmatism is a definite turnstile on the road from Hypermetropia to Myopia.

The effects of Mixed Astigmatism are more determined by the myopic meridian than by the hypermetropic one, so that it might almost be described as a myopic affection.

In the table given below the same division of figures and the same columns are used as in the previous tables. Naturally the figures are very much lower than in the previous tables.

The total number of cases of mixed astigmatism found was 34 out of a total of 432 cases investigated.

	1	2	3	4	5	6	7	8
	Father affected.	Mother affected.	Mother and father affected.	Father and other children.	Mother and other children.	Father & Mother & other children.	Other children affected.	None in family.
Number	3	7	3	1	1	1	4	17
Per cent.	8.8	20.5	8.8	2.9	2.9	2.9	11.7	50.0

When columns 1, 2 and 3 are added together, the percentage of children whose parents gave evidence of defective sight is found to be 38.2. This percentage is slightly higher than was found in the case of myopia. It is also significant that the separate percentages in columns 1, 2 and 3 correspond closely to those found in the results found in myopia (9.4, 22.4 and 5.1). Column 3 gives a somewhat higher percentage than in the case of myopia. All three columns are higher than in the case of Hypermetropia.

The familial influence or predisposition is obtained by adding columns 1, 2, 3 and 7 and gives a percentage of 49.8, and this is lower than was found in both Hypermetropia and Myopia.

Where however the numbers are so small, a very considerable error is liable to develop in the percentages, and scientifically little dependence can be placed upon them.

The percentage, where no evidence of defective sight could be obtained in the family, is rather higher than in the previous tables, namely 50.

As mixed astigmatism can hardly be recognised as a distinct defect by itself but rather as a mixture of myopia and hypermetropia, it would be difficult definitely to decide the influence that heredity plays.

Bishop Harman and Risley both consider it to be a transitional stage between hypermetropia and myopia, and from the very nature of the defect this would appear to be logical. In consequence figures obtained in this defect can only be taken as in support of figures on hypermetropia and myopia.

In this investigation the results obtained do correspond very largely to those obtained in the cases of hypermetropia and myopia. This applies to the hereditary influence and the familial predisposition.

When examining the children instances were found of more than one case of mixed astigmatism in a family. With the previous remarks about the percentage error borne in mind, it still must be concluded in this condition, as in the others, that the presence of defective sight in the parents has undoubtedly some effect on the production of mixed astigmatism in the children. The exact percentage of cases in which this occurs cannot easily be deduced from the small number of cases examined. It may be higher or lower than the figure (38.2) found in this investigation.

This concludes the part of the enquiry which was devoted to obtaining evidence on the influence of heredity on visual defect.

For the continuation of the enquiry into the influence of other factors, which will be taken in due order, entirely fresh series of figures are used.

The next factor investigated and now to be considered was—

(b) *The Influence of Age.*

This part of the investigation was devoted to obtaining evidence of the amount of visual defect found at different age periods of school life, and to the effect which growth in years has upon the incidence of cases of myopia, hypermetropia, and mixed astigmatism.

Methods of Procedure.

In this part of the enquiry entirely different methods of obtaining figures were employed. Whole schools were tested and the results tabulated into ages and sexes. (The sex influence will be dealt with in the next section of the enquiry.)

The same routine methods were pursued in examining the children's eyesight, as previously annotated.

The children were tested in definite age groups, which were adopted as follows :—

Group I. Ages 7 and 8.

Group II. Ages 9 and 10.

Group III. Ages 11, 12, and 13.

In all 1,000 children were examined, 485 boys and 515 girls, but in the results given, girls and boys are combined in the different age groups.

Below is given the table analysing the results found. The columns of the table are self explanatory :—

			Hyper- metropia.	Myopia.	Mixed Astigmatism.	Total No. and Percentage of Defect.
Age Group I.—						
Number	...	...	38	7	2	254
Percentage	...	...	14.9	2.7	0.7	18.3
Age Group II.—						
Number	...	...	53	18	2	339
Percentage	...	...	15.6	2.3	0.5	18.4
Age Group III.—						
Number	...	...	48	20	5	407
Percentage	...	...	11.7	4.9	1.2	17.8

The numbers examined are rather too small to give reliable statistics and percentages, but they serve to give some indication of the influence that age has upon the various errors of refraction amongst school children.

In the case of the Hypermetropic group of defects, it is seen that the percentage is slightly greater in the second age group (ages 9 and 10) than in the first group, but that in group three (ages 11 to 13) there is quite a considerable drop in the percentage found.

This agrees with the commonly accepted view that errors of refraction due to hypermetropic defects become less as children grow older.

Swanzy's opinion is that "Children are hypermetropic at birth, but with the growth of the body, the eye develops and becomes less hypermetropic."

Other oculists stated that many of the cases of hypermetropia found amongst very young children either become emmetropic, or as the result of school work myopic. They explain the presence of hypermetropia in older people as being due to an arrest of development in the eye at a stage before it has become emmetropic.

With such small numbers examined in this investigation it is difficult to say whether the percentage of error is markedly lessened or not. Sound conclusions could only be based on very much larger numbers, say 100,000 children. An even more scientifically correct method would be to examine a large number of children (somewhere in the region of 10,000) year by year, from the earliest age up to the years when school life ended, and thus get reliable figures as to diminution or otherwise of cases of hypermetropic errors. The difficulty of carrying out such a test is enormous and probably accounts for its absence.

The deduction to be drawn from the figures in this investigation is that the number of cases of hypermetropic defects shows a slight diminution amongst the older children.

In the case of myopia in the table given above, it is seen that there is a quite definite increase in the percentage of cases found amongst the older children. The remarks about percentage error due to paucity of numbers apply with equal force here, as in the case of hypermetropia.

So far, however, as the numbers go, they support the generally accepted view that the cases of myopia tend to increase amongst children of an older age.

Cohn gives striking figures on this point. He shows that the increase is progressive throughout school life. Risley, in Norris and Oliver's book, agrees with Cohn on the progressive percentage increase of myopic affections from the younger to the older ages of school children. He gives records of 28 cases which were examined by him from year to year, and states that his own cases without exception passed from hypermetropia to myopia through the turnstile of astigmatism.

Dr. Askins, writing in the Annual Report in 1913, gives the results of a large number of retinoscopic examinations of children. He states that 0·5 per cent. of children from 4 to 8 years of age exhibit myopic errors.

At age 9.	·88 per cent.	showed myopic errors.
At age 10.	1·1	„ „
At age 11.	·92	„ „
At age 12.	1·9	„ „

In Askin's reports, 334 children were examined. He also states that cases of low degrees of myopia which were absent from children examined below the age of 8 years become more common in the later ages. He comes to the conclusion that the 0·5 per cent. found below 8 years are congenital in origin and that the greater percentage in the later years is caused by acquired myopia.

During the course of the present investigation it was found that the girls showed a greater increase in the percentage of myopia in the later ages than the boys did. From the table it can be deduced that there is an increased percentage of myopic errors found amongst children of later years but it would be difficult to say whether this increase is commensurate with the decreased percentage of hypermetropia found at the same age period.

In the cases of Mixed Astigmatism it is noticed from the table that there is an increased percentage of cases found amongst the older children. This supports Risley's view previously quoted.

It is conceivable that mixed astigmatism may be a definite milestone in the journey from hypermetropia to myopia.

These figures, however, cannot be used as an instance of "Cause and Effect" without possibilities of serious error creeping in. It can only be deduced from them that the percentage of mixed astigmatism increases amongst the older children.

Again returning to the table it is seen that the total percentage of errors of refraction is diminished slightly in the older ages as compared with that of the younger ages.

No further deduction can be drawn from this.

The next factor to be considered is the influence that sex has upon percentages of defective sight, and is now annotated under the heading :—

(c) *The Influence of Sex.*

In this part of the investigation the series of figures considered under "The Influence of Age" is considered along with some others added. In all, 560 boys and 580 girls were examined, a total of 1,140.

In order to provide greater clearness in the tabulating of the results, 3 tables are given, one for each group of defects.

The total percentage of errors of refraction found amongst the boys was 16·0. Amongst the girls it was 21·3 per cent.

The table for the hypermetropic group of defects is given first and the others immediately afterwards :—

Hypermetropia.

			Total No.	No. Hypermetropic.	Percentage.
Boys	...	...	560	69	12.3
Girls	...	...	580	87	15.0

Myopia.

			Total No.	No. Myopic.	Percentage.
Boys	...	...	560	18	3.2
Girls	...	...	580	27	4.6

Mixed Astigmatism.

			Total No.	No. of Mixed Astigmatism.	Percentage
Boys	...	...	560	3	0.5
Girls	...	...	580	10	1.7

It will be seen from the above tables that girls have a larger percentage of defective sight than boys and that this applies to all the different groups of errors of refraction investigated. The largest relative difference in percentage is found in the case of mixed astigmatism.

The Annual Report of the School Medical Officer for the year 1914 shows that 37,130 boys and 37,314 girls of age 12 had their vision examined during the previous five years. Of the boys 14 per cent. have vision less than normal and of the girls 18 per cent. have vision less than normal.

In his Annual Report for the year 1910, the School Medical Officer gives a Table of the percentage of errors found in the two sexes.

It is quoted below :—

				Boys.	Girls.
Hypermetropic errors	...	...	...	13.9	17.3
Myopic errors	...	...	...	3.4	5.4
Mixed Astigmatism	...	...	...	0.5	2.5

These results correspond closely to the results found in this investigation.

In the compilation of the table given in the section on the influence of age, it was found that the proportion of errors of refraction was greater in girls than in boys at all age periods.

It is difficult to find a satisfactory reason for the greater proportion of errors of refraction found amongst girls, especially when the proportion is found to be greater in all the different groups of defects considered. If it were found in myopia alone it might be accounted for by the amount of fine sewing performed by girls and also to some extent by the greater amount of reading done by them. This explanation, however, is without foundation on fact when it is found that hypermetropic errors and errors due to mixed astigmatism are also found in greater proportion in girls.

The theory has been advanced by oculists that the higher percentages of myopic errors in girls are due to close work, but it has not been advanced that hypermetropic errors are also increased in girls by the same pursuits. It cannot be true in both cases and is probably true in neither. No satisfactory reason can be given for this phenomenon on the results of this investigation. In the section on Heredity it will be recollected that the maternal influence appeared to be the stronger also in the production of defective sight in the children. There would appear to be some connection between the two phenomena.

The fact then can only be noted that girls exhibit a higher percentage of visual defect than boys and that this is also true for all the different groups of errors of refraction considered.

The next factor which was investigated and which is now to be dealt with, was :—

(d) *The Influence of the Lighting of Schools.*

It has hitherto been a common and widely accepted view that defective lighting in schools has a deleterious effect on the eyesight of the children. Many oculists have even expressed an opinion that this is an actual cause of Myopia.

Cohn and his followers were of the opinion that defective lighting was an active agent in the production of myopia amongst school children. Risley supports this view. Recently, however, in this country some doubt has been cast on this opinion by competent observers.

A part of this investigation therefore was devoted to obtaining some evidence on this important question. This part was conducted with the same schools and numbers of children as in some of the other sections but special tests were made of the lighting of the schools.

It must be noted, however, that it is difficult now to find schools where the lighting is extremely bad and the schools given as possessing defective lighting are only relatively defective.

In view of the fact that the eyesight of country children is generally considered to be less liable to errors of refraction than that of urban children, it was decided that schools situated in both localities should be tested : moreover, that schools badly lighted should be considered and compared with schools more efficiently lit in their own locality and not with schools in a different environment. Thus more strictly comparable results could be attained. Such schools then were chosen in both rural and urban areas.

It was necessary to test the lighting of the schools in order to get a basis on which to work.

Method of Testing the School Lighting.

School work is practically all performed in the hours of daylight so that it was necessary to test this only.

There are many forms of apparatus available for the testing of light values and most of them are extremely cumbersome and difficult to transport. The result aimed at was, not so much the estimation of the lighting values of a school, as some standard which would act as a basis for purposes of comparison between one school and another.

In order to obtain this standard an ordinary photographic exposure meter was used and was found satisfactory for the purpose.

The principle on which this exposure meter acts is, that a strip of sensitive paper when exposed to light changes from white to black through a variety of shades in accordance with the length of exposure. It possesses a strip of paper of a standard shade with which the shade of the sensitive paper has to be compared. The time taken by the sensitive paper on exposure to light to reach the standard shade is noted.

The exposure meter was used in this way. It was exposed to light in three or more positions in each classroom of the school ; the positions being one nearest the main source of light, one furthest away, and one or more at the mid distance. The time of exposure which the sensitive paper took to reach the standard shade was noted in each case, and from these readings an average time was then struck for the classroom. Readings in the open air were taken before and after testing each classroom in order to obtain controls. The average time of exposure in each room was unified on the open air tests by dividing the average time in seconds of the outside test by the average time in seconds of the classroom tests. This gave a fraction of unity, e.g., .1 or .01.

An average of each school was then obtained by adding the decimal fractions and dividing by the number of classrooms.

As each school was thus unified on the outside readings, the results were strictly comparable between school and school.

A certain amount of care had to be exercised in performing these tests in order to avoid direct sunlight, as otherwise the results would have been vitiated. The outside readings were taken facing north for this reason. As far as possible, bright and cloudless days were chosen, and all tests were performed at the same season of the year and in the hours just before and just after mid-day. The inside readings were taken on the school desks at which the children work.

Strictly comparable results were thus obtained.

The same methods of testing the children's eyesight were pursued as previously described. All the children in the school from age six upwards were tested. Infants were not tested as they are so unreliable to Snellen's test. All children who could not see 6/6 with each eye were subjected to a retinoscopic examination. As an extra precaution those children who presented any appearance of eyestrain were also examined retinoscopically.

Only those children who exhibited errors of refraction of one dioptré or over were noted as presenting evidence of defect. All under one dioptré were enumerated as normal.

The urban and rural schools are considered separately. The results found in the urban schools are now given.

	Light Intensity.	No. of Children.	Per cent. of Hyper- metropia.	Per cent. of Myopia.	Per cent. of Mixed Astig- matism.	Total Per- centage of Defect.
School 1 ...	0.11	225	14.6	5.3	0.8	20.7
School 2 ...	0.12	123	20.3	0.4	...	20.7
School 3 ...	0.03	216	15.2	1.3	1.3	17.8
School 4 ...	0.05	186	15.0	2.6	1.0	18.6

Before proceeding to analyse the results of this table it must be stated that these urban schools were all situated in one industrial area, where the work of the population, the quality of housing, the question of intermarriage and the general environment were the same for all.

It will be seen from the table that the schools give a good variation in light intensity. Schools 1 and 2 give the best lighting results, and Schools 3 and 4 are much less efficient in this respect. In the actual performance of the lighting test the time of exposure gave even more striking differences between the schools than can be grasped from the decimal figures. In school 2 the average time for the school was 2 minutes 55 seconds, whereas in school 3 it was eleven minutes, the outside lighting test being approximately the same in each instance.

Analysis of the table shows that the total percentage of visual defect in the better lighted schools is actually higher than that found in the less efficiently lit. The two better lighted schools give the same percentage of defective sight, 20.7. The worst lit school No. 3 gives the lowest percentage of errors of refraction.

If schools 1 and 2 be combined together, their lighting tests being approximately the same, and schools 3 and 4 be similarly combined, better figures for purposes of comparison are obtained. The numbers examined in each group of schools then are respectively 348 and 402. The percentages of visual defect are respectively 20.7 and 18.2.

Although these figures show that there is a lower percentage of defective sight in the less efficiently lighted schools than is found in the better lit schools it cannot be deduced from these figures that bad lighting in schools is better for the children's eyesight than good lighting.

It can, however, be safely concluded that the total percentage of visual defect is no greater in the less efficiently lighted schools than it is in the better lighted.

Taking the different groups of errors of refractions separately, it is seen in the case of *hypermetropic* defects that school 1 gives the lowest percentage and school 2 (the best lighted) gives the highest. The less efficiently lit schools occupy an intermediate position. Combining schools 1 and 2 and 3 and 4 together as before, the respective percentages are 16.6 and 15.1. The percentage of hypermetropic errors is greater in the better lighted schools.

Where, however, the numbers examined are so small it is difficult to dogmatise and it can only be concluded that hypermetropic errors of refraction are not increasing in number in the less efficiently lighted schools and that defective lighting in school is not an active agent in the production of hypermetropic errors.

Myopia.

Analysis of the table with respect to myopic conditions shows that the best lighted school (School 2) shows the smallest percentage of myopia. In the other well lit school, No. 1, the percentage of myopic errors is the highest of all, the two badly lit schools showing quite low percentages. Combining schools 1 and 2 and schools 3 and 4 as before, the respective percentages are 3·7 and 1·9.

These figures show that where the lighting is good the percentage of myopia is greater than where the lighting is less efficient. This result is in direct contradiction to the commonly accepted view that defective lighting, or working in a dim light, is productive of myopic conditions. Incidentally it might be mentioned that miners who work in a dim light show no higher proportion of myopic affections than any other working trade.

Cohn is most emphatic in his view that defective lighting in schools causes myopia. He found, however, that in schools where he had improved the hygienic conditions and lighting, the percentage of myopia did not lessen nor differ from that found in less well lighted schools.

Mixed Astigmatism.

In this defect the percentage of defects found does show an increase in the darker schools over the better lit, namely, 1·2 per cent. as opposed to 0·5 per cent.

The numbers found suffering from this defect were so small that the percentage error becomes a large one and no scientific conclusion could be based on such small numbers. It can only be pointed out that the percentage of mixed astigmatism found was greater in the less well lit school and that this is contrary to what was found in the case of myopic errors.

Rural Schools.

Six schools in all were examined in rural areas. They were widely scattered and had limited attendances of children. In consequence the numbers examined were small. In all, 193 boys and 197 girls were examined, a total of 390.

The same methods of procedure in the lighting tests and eyesight tests were adopted as in the urban schools. Below is given the table of results found :—

	Light Intensity.	No. of Children.	Per cent. of Hypermetropia.	Per cent. of Myopia.	Per cent. of Mixed Astigmatism.	Total Percentage of Defect.
School 5	0·35	71	8·4	7·0	...	15·4
School 6	0·1	69	11·5	11·5	1·4	23·4
School 7	0·03	36	5·5	...	2·7	8·2
School 8	0·1	21	9·5	...	...	9·5
School 9	0·07	43	16·2	9·3	2·3	27·8
School 10	0·15	150	8·0	4·6	1·3	13·9

The worst lighted school (No. 7) shows the lowest percentage of defective sight and the best lighted (No. 5) shows a higher percentage of defective sight than others less well lighted.

As only small numbers have been examined in each school, the percentage error becomes very high and in consequence much reliance cannot be placed upon them. Schools 5, 6, 8 and 10 are all well lighted schools and all show a higher percentage of defective sight than School 7, the worst lighted of all. School 9, which is only comparatively well lighted, shows a very high percentage of error, but this school will be dwelt upon later on in the section on the Influence of Consanguinity along with School 6.

Hypermetropia.

The percentages are all rather lower than in the urban schools and if Schools 6 and 9 be excluded the percentages are no greater in the less well lighted than in the better lighted schools.

Myopia.

The paucity of numbers examined makes it difficult to form a conclusion but little difference would appear to be present between the well lighted and the less efficiently lit (Schools 6 and 9 being excluded for the reasons mentioned above).

Mixed Astigmatism.

No conclusions can be drawn from the figures in these schools where numbers are so small but it would appear that here again there is a slight increase of percentage in the darker schools.

Considering now both urban and rural schools, the following conclusions can be made.

Hypermetropic errors.

That the percentage of errors found is no greater in the badly lighted than the better lighted schools and that defective lighting in schools *per se* is not a cause of hypermetropia.

Myopia.

Here again the percentage of errors found is no greater in the badly lighted than in the well lit schools and defective lighting in schools appears to have no effect on the production of myopic conditions in school children.

Mixed Astigmatism.

The less efficiently lighted schools show a greater percentage than the more efficiently lit.

The next factor to be considered is :—

(e) The Influence of Environment.

It is a generally accepted view that the vision of a population whose pursuits are principally agricultural is on the whole better than that of a population whose pursuits are industrial. This section of the investigation was devoted to obtaining evidence of the truth or otherwise of this dictum when applied to children attending rural and urban schools.

Four urban schools and six rural schools were examined. The same schools and number of children examined are utilized as in the previous section on School Lighting. The methods of testing the vision has been already described. It was found difficult to get rural schools in Mid-Lancashire where the work of the population was entirely agricultural, but schools were chosen in districts where the work was mainly agricultural. It has already been noted that the numbers examined in the rural schools were small and in consequence not equal in numbers to those examined in urban schools and therefore not entirely comparable. The results are, however, given in percentages in order to overcome the difficulty.

In the urban schools 750 children (367 boys and 383 girls) were tested, whereas in the rural schools 390 (193 boys and 197 girls) were examined.

A table is given below of the results found :—

<i>Urban.</i>			
No. Examined.	Hypermetropia.	Myopia.	Mixed Astigmatism.
750	15.8	2.8	0.9
<i>Rural.</i>			
390	9.4	6.1	1.5

Hypermetropic errors show a marked diminution in the rural schools as compared with that found in the urban schools.

Myopic errors. Here the position is reversed and the rural schools show a much higher percentage than the urban.

Mixed Astigmatism shows an increase in rural schools. The total percentage of visual errors in urban schools is 19.5, whereas in rural schools it is 17, so that on the whole fewer errors of refraction are found in rural schools.

The percentage of myopic errors found in rural schools is rather high and is no doubt increased by the paucity of numbers examined, but also by the fact that in two of the schools examined the influence of consanguinity is a strong one (this will be considered later). It cannot therefore be concluded from these figures that there is more myopia to be found in country schools than in urban schools but it would be more correct to conclude that myopic defects are as common in rural schools as in urban schools.

The same remarks apply also to mixed astigmatism.

In the Annual Report of the Medical Superintendent of Schools, Lancashire (1912), Dr. Jones gives some statistics on this question. He examined 1,955 urban children and 704 rural children and he found the percentage of errors of refraction to be as follows :—

		No. Examined.	Hypermetropia.	Myopia.	Mixed Astigmatism.
Town	... ..	1,955	12.9	3.7	2.0
Country	... ..	704	13.8	3.0	1.5

His view was that country children showed as many defects as town children and their eyesight was no better.

It is a matter of considerable doubt as to how much effect residence in town or country has on the causation of errors of refraction. A slightly lower percentage of errors is usually found amongst rural children but the difference is very small.

It is difficult to explain why there should be a lower percentage of errors of refraction amongst rural children. Certainly their general physique and health are usually better than that of town children and yet some of the worst cases of myopia are found amongst agricultural labourers. The hygienic conditions of the home cannot account for it because the worst housing conditions are usually found in rural areas.

It is in hypermetropic defects that the greatest diminution in percentage is found, so it is probable that the real reason for this diminution in rural children is, that they live a more natural life and grow up under better conditions of open air and feeding.

It was noted during the course of this investigation that a larger percentage of defects was found amongst children coming from streets of the slum type, but there are other circumstances that must be considered in connection with such cases over and above the insanitary surroundings. It has generally been found that people who gravitate to such localities are of the "Ne'er do well" class and persons of a low type of mentality. This undoubtedly has an influence on the amount of defective sight because it is known that errors of refraction are very common amongst the mentally unstable. It is common to find high degrees of myopia amongst children from such localities.

The work of the locality does not appear to have any marked influence on the amount of defective sight found. In the urban schools examined, the work of the locality was mainly cotton weaving, which demands good vision and concentration of sight. The children of such parents were found to differ but slightly in visual acuity from the children of agricultural parents.

Cohn mentions that the children of compositors show a large percentage of myopic defects, the parents also exhibiting a similar phenomenon. He is of the opinion that family crafts predispose to such errors of refraction. His opinion is not supported by the results obtained in this enquiry.

The conclusion based on this enquiry is, that except possibly in the case of hypermetropia where a slight diminution is shown in rural areas, the more artificial life of towns has no more effect than the more natural country life on the incidence of errors of myopia and mixed astigmatism.

(f) *The Influence of Consanguinity.*

It was mentioned in the two previous sections that in two schools where high percentages of errors of refraction were found, intermarriage was a prominent feature in the locality where the schools were situated. These schools will now be considered in more detail. The schools concerned are 6 and 9 in the tables shown in the section on the "Influence of School Lighting."

It was found when examining these schools for that section of the investigation that abnormal percentages of errors of refraction were found and therefore some enquiries were made into the home conditions and general family histories of the children.

Both these schools are situated in secluded neighbourhoods, untouched by railways and off main highways.

In School 6 it was found that every child in the school was related to every other child present and the relationships were both complex and extremely confusing. This was due to the repeated intermarriages for generations, so that the school could almost be considered to consist of members of one family.

A table is now given of the results found in this school.

<i>School 6.</i>				
	No.	%	%	%
	Examined.	of Hypermetropia.	of Myopia.	of M. Astigsm.
Boys ...	42	14.2	7.1	...
Girls ...	27	7.4	18.5	3.7
	—	—	—	—
Total ...	69	11.5	11.5	1.4
	==	==	==	==

In the area in which School 9 was situated it was found that intermarriages were also common but not to such a marked extent as in School 6 locality. The figures are also given of :—

<i>School 9.</i>				
	No.	%	%	%
	Examined.	of Hypermetropia.	of Myopia.	of M. Astigsm.
Boys ...	24	16.6	12.5	4.1
Girls ...	19	15.7	5.2	...
	—	—	—	—
Total ...	43	16.2	9.3	2.3
	==	==	==	==

Analysing first the hypermetropic errors, it can be seen that these show a high percentage for rural schools, much higher than the average percentage (7.8) for the other four rural schools tabulated in the section on School Lighting. The numbers examined of course are small and the percentage error is probably large but the same error applies to the other rural schools examined at the same time and yet the average percentage of hypermetropic defects is much smaller in them.

It must therefore be concluded that Intermarriage is a factor which does have an effect on the etiology of hypermetropia.

Myopic errors must next be considered and it will be seen from the tables that the percentages found are abnormally high in both schools.

Pearson has stated that the average percentage of myopic errors of refractions found amongst school children is 3. These schools exceed this percentage markedly. The average percentage for the four other rural schools examined was 2.9 of myopic errors and this percentage is greatly exceeded by the schools 6 and 9. It will also be seen in the tables that both girls and boys exhibit the marked increase and yet both schools are well lighted.

It must be concluded that intermarriage amongst the parents is a very potent factor in the etiology of myopic errors of refraction.

The number of cases found with mixed astigmatism was small and therefore difficult to utilize for the basis of a conclusion, but the percentage found is slightly greater than the average.

This section on Consanguinity ought strictly speaking to have been included under the heading Heredity but as different methods were pursued in dealing with the figures and different children were examined, some lack of continuity in that section would have appeared.

It was considered also that the striking results found justified a separate section.

Whilst not coming strictly within the compass of this enquiry, in that no special investigation was made into the subject, but in view of the authorities quoted from other countries, it was felt that the question of Etiology of defective vision could not be completed without a few observations on :—

(g) *The Influence of Race.*

In this country hypermetropic errors usually predominate amongst school children and myopic errors show a much less percentage. In Germany the percentage of myopic errors is very much higher than in England. The Americans also show a large percentage of myopic errors.

Native races, such as the American Indians have a large percentage of hypermetropic defects and a low percentage of myopic ones.

In the Jews, the percentage of myopic defects quite overshadows the hypermetropic ones. The author of this investigation found in Manchester out of a very large number of Jews examined with defective sight, only one hypermetropic case, all the rest were myopic. These were hospital patients, not all school children.

The racial influence is a strong one in the etiology of visual defect due to errors of refraction.

A RESUMÉ OF THE RESULTS FOUND AND THE CONCLUSIONS
BASED ON THEM.

The various groups of defects are considered separately :—

Hypermetropic Defects.

- (a) Heredity.—A history of parental defective vision was found in 28·3 per cent. of cases. Mothers were affected more often in the proportion of 17·7 per cent. to 6·7 per cent. of the fathers. The familial predisposition was found in 58 per cent. of cases.
- (b) Age.—The percentage was found to have decreased from 14·9 in the younger children to 11·7 in the older.
- (c) Sex.—Fifteen per cent. found in girls and 12·3 per cent. in boys.
- (d) School Lighting.—Rather more found in better lighted schools than in the less efficiently lit in proportion of 16·5 per cent. to 15·1 per cent. in urban schools and a similar result found in rural schools with less percentages.
- (e) Environment.—Less found in rural schools than in urban schools, but the difference in the percentages is probably small.
- (f) Consanguinity.—Increased percentage found where the parents are inter-married and closely related.
- (g) Racial.—More hypermetropia found in English people than myopia.

The conclusions based on these results have to a large extent been embodied in the report, but are now recapitulated.

- 1.—That heredity plays a very large part in the production of hypermetropic defects and a history of parental defective sight will be found in about 40 per cent. of all cases of hypermetropia. The maternal side of the family has a greater influence in passing on defective sight. All children in the family are not affected where one or other parent is defective in sight. In about 60 per cent. of cases of hypermetropia, other members of the family exhibit defective sight.
- 2.—The number of cases of hypermetropia was found to be decreased amongst the older children, but whether this was due to a certain number of cases of hypermetropia becoming myopic or to a certain number becoming emmetropic, it was not possible to decide. The latter is probably true, for hypermetropic defects are known to show a tendency to spontaneous cure.
- 3.—Hypermetropia is less common in boys than in girls. No satisfactory conclusion can be based on this phenomenon. There may be some connection between this fact and the fact that the maternal influence is the greater in Heredity. The more open-air life and consequent improvement of physical condition of boys may have some bearing on this fact.
- 4.—The number of cases of errors of refraction due to hypermetropic defects was found not to be influenced at all by the lighting of schools. Defective lighting in schools is certainly not a causal agent of hypermetropia.
- 5.—Hypermetropia is slightly less common in rural areas than in urban, but the difference in percentage of cases is very small. Residence in town or country has no influence in the causation of hypermetropic conditions, and but slight effect in their persistence.
- 6.—Close relationship between the parents is a potent factor in the causation of hypermetropia, and the percentage of cases found in such families is very much above the average.
- 7.—Hypermetropia is the commonest error of refraction found amongst English school children.

In conclusion, it may be said that whilst hypermetropia may be the normal state of a baby's eyes at birth, the persistence of this state, or its allied astigmatisms, is determined largely by the question of heredity. It is logical that the size of a child's eye should be determined by the size of the parents' eyes, just as the child's height or length of limbs or colour is so determined.

Mendel's Law is no doubt also applicable here.

Myopic Defects.

- (a) Heredity.—Evidence of parental defective vision was found in 36.9 per cent. of cases. The maternal defect was found to be 22.4 per cent., as compared with 9.4 per cent. in the father. Other children in the family were found to have defective vision in 19.8 per cent. of cases where no parental defect apparently was present. The familial predisposition was found in 56.7 per cent. of the cases.
- (b) Age.—The percentage of cases affected was found to be greater amongst older children; 4.9 per cent., as compared with 2.7 per cent. in the younger.
- (c) Sex.—More myopic defects were found in girls than in boys; 4.6 per cent., as compared with 3.2 per cent.
- (d) School Lighting.—3.7 per cent. found myopic in well lighted schools, and 1.9 per cent. in less efficiently lit schools in urban areas. An increased percentage also found in well lighted schools in rural areas.
- (e) Environment.—Myopia found slightly more commonly in rural areas than in urban areas. More myopia found amongst children from slum streets than the average.
- (f) Consanguinity.—Close relationship between the parents produces a very much higher percentage of myopic errors amongst the children than the average. Ten per cent. was found, as compared with 3 per cent. the average. Both girls and boys showed an increased percentage.
- (g) Racial.—The percentage of myopic defects is lower in English schools than in Germany or the United States. Jews show a high percentage of myopic errors.

The conclusions based on these results have been given under the heading of each factor considered, but are now repeated.

- 1.—That heredity is probably the most important factor in the etiology of myopic defects. Parental defective sight has been found in at least 36 per cent. of the cases. The maternal influence in heredity is greater than the paternal one. Generally more than one case of myopia is found in a family. All the members of a family are not as a rule affected, and those who have defective sight are not all affected by myopic conditions. Mixed astigmatism is not uncommonly found in brothers or sisters of those affected by myopia, but other defects are also found. In about 60 per cent. of the cases, other members of the family are affected by errors of refraction.
- 2.—More children affected by myopic errors of refraction are found in the older ages, but this increase is not commensurate with the decrease in hypermetropic defects. It must not be concluded that this increase in number of children affected by myopic defects is due to what is commonly called acquired myopia, but rather to the fact that myopia is probably always due to an inherited or inherent weakness of the coats of the eyeball, and that these coats yield somewhat and thus produce myopia owing to the demands which the growth of the child puts upon its strength. This theory of the increased percentage of myopia found in the older ages was arrived at because it was found that the factors such as school lighting, which are commonly supposed to cause myopia, were found to have no effect on its etiology.
- 3.—More myopic defects are found in girls than in boys, and no satisfactory explanation of this fact can be found. It is certainly not due to the sewing done by the girls because other errors of refraction which cannot be effected by near work are also found to have a higher incidence in girls than in boys.
- 4.—Defective lighting in schools has no effect on the incidence of myopic errors. As many defects are found in the children attending well lighted schools as in those attending less efficiently lit schools, and this applies to both rural and urban schools. Defective lighting in schools is not a causal agent in the production of myopia.
- 5.—Myopia is just as frequently found in rural areas as in urban areas, and town life is not an influence in the production of myopia. More myopia is found amongst the children coming from the poorer-class streets, but this is probably more due to the low mental development of their parents than to the insanitary surroundings.

- 6.—Close relationship between parents was found to be a potent factor in the etiology of myopic defects. The children of such marriages show an incidence of myopia three times greater than the average.
- 7.—Myopia is nothing like so common amongst English school children as it is amongst the Germans, Americans or Jews.

In conclusion, heredity is probably the most potent factor in the etiology of myopic defects. The so called acquired myopia is not acquired in the true sense, that disease or defect has been produced in a previously healthy organ by purely extraneous circumstances or influences, but is rather to be regarded as a development or manifestation of defect in an eyeball which has an inherent weakness in the coats. This inherent weakness is hereditary and the myopia would ultimately develop in the eye in whatever situation the child be placed.

A myopic condition of the eye must be regarded as a diseased condition. It is closely related to the neuroses and other diseases of the higher mental centres.

Mixed Astigmatism.

- (a) Heredity.—38·2 per cent. of the parents of children affected by mixed astigmatism showed evidence of visual defect. The maternal influence was greater than the paternal ; 49·8 per cent. of the cases affected with this defect showed visual defect amongst other members of the family. Brothers or sisters of the cases examined showed myopic errors frequently, but hypermetropic errors were also found.
- (b) Age.—1·2 per cent. found in the older ages, as compared with 0·7 per cent. in the younger children.
- (c) Sex.—More cases found amongst girls than boys in the proportion of 1·7 per cent. to 0·5 per cent.
- (d) *Lighting*.—More cases found in the less efficiently lighted schools than in the well lighted. This applied to both rural and urban schools examined.
- (e) Environment.—A larger percentage of cases found in the country schools than in the urban schools.
- (f) Consanguinity.—The percentage of errors found is markedly increased over the average percentage where the parents of the children are found to be closely related before marriage.

Conclusions.

- 1.—That heredity plays a large part in the production of errors of refraction due to mixed astigmatism, and that the maternal influence is the more potent one in passing on the defect to the next generation. The familial predisposition to this defect or other defects of sight was found to be about 50 per cent.
- 2.—More cases of this defect are found in older children, and more frequently in girls than in boys, conditions which are also found in myopia.
- 3.—More cases are found in schools where lighting is defective.
- 4.—More cases are found in country schools than in urban schools.
- 5.—Close relationship between the parents is a potent factor in producing this defect.

All these conclusions regarding this defect must be taken as relatively accurate only, as, due to the paucity of numbers found, the percentage error was a large one and the findings, therefore, have not the scientific value which they would have had if based on larger numbers.

Dr. A. C. Crawford contributes an article on "The Prevention of the Heart Disease of Childhood," with special reference to the Importance of Heart Sounds.

THE PREVENTION OF THE HEART DISEASE OF CHILDHOOD, WITH SPECIAL REFERENCE TO THE IMPORTANCE OF THE HEART SOUNDS.

A consideration of the principal causes of death in the Registrar-General's Statistics for 1927 reveals the fact that, during the year, 72,109 persons died from Heart Disease (148 out of every 1,000 deaths). Cancer, Tuberculosis, Bronchitis, Pneumonia and Old Age were a long way behind in the list as causes of death.

These figures, representing only the fatal termination, are indicative of a large amount of chronic ill-health, crippling, and lack of efficiency.

A knowledge of the fact that almost one-half the number of persons who ultimately died from diseases of the heart, contract that disease during childhood, reveals the added burden on the community. The infection which is the cause of this heart disease, in the majority of cases in children, is that known by the name of "Rheumatism."

Unfortunately the precise nature and definition of Rheumatism is obscure. Perhaps it may best be considered as a chronic progressive infection generally commencing in childhood, characterised frequently by acute exacerbations at uncertain intervals, most commonly choosing as its selective sites bloodless or almost avascular tissues, causing inflammation of joints, chorea (St. Vitus' dance), endo-, peri-, and myo-carditis (inflammation of the heart), nodules, pleurisy, interstitial myofibrositis (growing pains), and at times producing hæmorrhages into, and erythematous rashes of, the skin, the probable initial site of infection being the lymphoid tissues of the pharynx and nasopharynx, that is to say, the tonsils and adenoids.

At the present time, consensus of opinion tends to regard any of the above conditions as possible evidence of rheumatism and to realise that any of them may be concurrent with Heart Disease.

The causative agent of this Rheumatic Infection is believed to be a micro-organism of low virulence; in other words, Rheumatism, with its protean manifestations is a germ-produced disease.

In any disease of microbic origin, the outer defences of the body must first be penetrated before the disease can mature. It is commonly accepted that in the case of Rheumatism the initial onslaught is made upon the lymphoid tissue of the pharynx and naso-pharynx. One of the essential functions of lymphoid tissue is that of a defensive mechanism whereby the body is protected from the attack of micro-organisms or their toxins. But when, owing to persistent attack, the defensive out-posts in pharynx and naso-pharynx are overcome; when, in other words, tonsils and adenoids, as frequently evidenced by gross hypertrophy, having done their utmost to cope with the attack, are overcome and turned into a veritable stronghold of enemy bacteria within the body defences, from which, at the slightest weakening of the general immunity, very serious and crippling raids are carried out, then it is indeed time to eradicate them.

An individual, therefore, who presents any of the symptoms or signs of Rheumatism, and in whom there is evidence of unhealthy lymphoid tissue in the pharynx or naso-pharynx, should have such foci eradicated as soon as circumstances permit. Only by such methods may the menace of Rheumatism, together with its concomitant Carditis be satisfactorily countered. It cannot be too strongly emphasised that the great majority of evidence on this subject available to-day is in favour of the early removal of unhealthy tonsils and adenoids. Even if cardiac damage already exists, operative interference must tend to minimise its progress or its extension.

Unfortunately, once infection of the endocardium has occurred, the damage is irreparable so far as therapeutic measures are concerned, and the most that can be hoped for is that the lesion may become quiescent. This can only be secured by reducing the work of the heart to the minimum. Without entering deeply into a discussion of cardiac physiology and pathology, it is well known that valvular lesions are of no great import, provided that the cardiac muscle can maintain an efficient circulation. This can only be secured by hypertrophy of the myocardium, necessitating a drainage of the reserve of energy of the heart, so that a progressive valvular lesion gives rise to the formation of a vicious circle which terminates in an attack of heart failure, when an efficient circulation can no longer be maintained. At all costs the initial lesion, whether in the valvular or mural endocardium, must be given time to become quiescent, and the associated toxic myocardium must have as little work as possible thrown upon it, whilst trauma, which plays such an important part in lowering the local resistance of the endocardium, must be reduced to the minimum. Such trauma is undoubtedly lessened by a lowering of the systemic systolic blood pressure, which may

be secured by complete rest, whilst at the same time the myocardial nutrition, dependent mainly upon the diastolic pressure and the length of diastole, is greatly benefited.

Complete rest, then, is the first essential in the treatment of carditis, and the earlier immobilisation is secured, the better the prognosis. Latham states that a day gained in the treatment of Heart Disease is a gain indeed, and never was statement more worthy of universal acceptance and emphasis. Time lost at the commencement of carditis can never be regained. Early diagnosis and early immobilisation are the only ways in which those striking figures of the Registrar General can be satisfactorily lowered.

But it is, unfortunately, only too true that the early diagnosis of rheumatic lesions in the heart presents grave difficulty. Well marked valvular lesions, which from the diagnostic standpoint are relatively easy, are from the prognostic standpoint of less importance. Cardiac enlargement, well marked thrills, well marked murmurs, though satisfying academically, picture rather a hopeless future for the small sufferers. Murmurs, with their many classifications and theoretical interpretations, are interesting yet confusing, and often their significance is obscure, and difficult to assess, in the absence of other physical signs. It is only too obvious to the thoughtful investigator that when the classical physical signs of endo-cardial and myo-cardial lesions make their appearance, the time most advantageous for successful treatment has been lost, and can never be regained.

Of recent years, a better understanding of the physics of the heart and circulation has been attained, and stress has been laid on the fact that in all pathological conditions, some variation of the actual heart sounds occurs. From the standpoint of early diagnosis, the quality of the cardiac sounds is of first importance, and it was the appreciation of this fact, and of the gravity and national importance of rheumatic heart disease, which led the writer to embark upon the subsequent investigation.

Procedure of Examination.

The following procedure was adopted during the Routine Medical Inspection of fifteen hundred of the older children in attendance at some of the Elementary Schools in Area 30. Entrants were considered unsuitable for inclusion in the investigation on account of the greater emotional stresses occasioned in them by Medical Inspection.

On conclusion of the usual Routine Inspection, the cardiac condition was specially investigated. Inspection and palpation having been followed by the ascertainment of the deep cardiac dulness, the heart was auscultated over at least six points, the two areas additional to those usually described being, firstly, an area situated just internal to, and above, the maximum apical thrust, and secondly, an area in the fourth left interspace half an inch from the sternal margin.

The heart sounds were definitely described, and recorded, in every case in which a definite alteration from the normal relationship was found. In assessing such anomaly, the normal variations of the physical signs in the child, as distinct from those in the adult, were carefully considered, as also were such factors as the density of the chest wall and emphysematous conditions of the lung. Every effort was made to secure an unbiassed mental appreciation of the auscultatory findings, and especially of the cardiac sounds. Finally the radial pulses were simultaneously palpated.

The following tables record the physical signs in those cases in which some definite variation from the normal was encountered. For the sake of clearness various signs and abbreviations are used in the tables, the explanation of which is given with them.

The Physical Basis of the Heart Sounds.

Brief mention of the physical basis of the Heart Sounds, as having a direct bearing on the interpretation of the subsequent tables, may be made at this point.

The first Heart Sound, though on analysis composed of two distinct notes, is normally audible to the human ear only as one sound. It is produced by vibrations set up in

1. The muscular walls of the ventricles.
2. The cusps of the auriculo-ventricular valves.
3. The mass of blood in the ventricles at the moment of systole.

The second Heart Sound, again a combined note, is normally a shorter sound of higher pitch and greater purity than the first sound, and is produced by vibrations set up in

1. The columns of blood contained within the aorta and pulmonary artery on closure of the semi-lunar valves.
2. The semi-lunar valves immediately after their closure.

In the case of the first Heart Sound, the predominant note is that produced by the vibrations in the musculature of the ventricles, whilst in the case of the second sound, the predominant note is that produced by vibrations of the semi-lunar valves guarding the aorta and pulmonary artery.

Hence it is submitted that, in view of our present knowledge of cardiac pathology, some alteration of the cardiac sounds is, of all the physical signs, the most likely to give that early evidence of involvement which is so essential. It is not for a moment suggested that all such alterations are diagnostic of organic carditis, but rather that such lesions must of necessity produce such alterations, and that the latter, when present in the individual in whom other manifestations of rheumatism are present, form strong presumptive evidence upon which every reasonable precaution should be taken.

EXPLANATION OF TABULAR SIGNS.

In order to facilitate inspection of the Tables, blank spaces represent *Normal* findings.

† Represents cases of suspected Organic Heart Disease.

‡ Included in Table III.

“Apex” = Character of Apex Beat. F = Forcible.

F & D = Forcible and Diffuse.

“Rate” = Frequency. T = Tachycardia = Frequency > 100 per minute.

T + = Marked Tachycardia.

“Rhythm.” E.B.(v) = Ectopic Beats of Ventricular Origin.

“Enlargement.” This physical sign was based on the correlation of the position of the maximum apical thrust and the ascertainment of the deep cardiac dullness.

+ = Definite enlargement.

++ = Marked „

+++ = Gross „

“Thrills.” S = Systolic. D = Diastolic. P.S. = Pre-Systolic.

A = Apical Area. B = Basal Area. C = Central Area.

f = fine. c = coarse.

“Sounds.” M 1. = First heart sound as heard at the “Mitral” Area.

M 2. = Second „ „ „

P 2. = Second „ „ “Pulmonary” Area.

A 2. = Second „ „ “Aortic” Area.

T 2. = Second „ „ “Tricuspid” Area.

+ = Accentuation. ++ = Marked Accentuation.

S — = Softening. I = Impurity. R = Reduplication.

s = shortened. p = prolonged. c = coarse.

“Bruits” S = Systolic. D = Diastolic. P.S. = Pre-Systolic.

f = fine. c = coarse.

A = Apical Area. B = Basal Area. C = Central Area.

P = Pulmonary Area. M = Mitral Area.

“Diagnosis” En = Endocardial. H = Hæmic.

Ex = Exocardial. C.P. = Cardio-Pulmonary.

P = Physiological. P.P. = Pleuro-pericardial.

TABLE I.
PHYSICAL SIGNS IN CASES SHOWING DISORDERS OF CARDIAC RHYTHM.

Sex.	Age.	Apex.	Rate.	Rhythm.	Enlarge- ment.	Thrills.	M1.	M2.	P2.	A2.	T2.	Bruits.	Diagnosis.	REMARKS.
†F	8	...	...	Foetal	...	...	S—	...	...	...	...	...	...	? Rheumatic Myocarditis. Rheumatic Fever at 3. Erythema Nodosum recently.
†F	8	...	T	Foetal	...	...	...	No note.	...	...	...	...	...	Tonsillectomy 1 year ago. Many previous attacks of Tonsillitis.
†F	8	F	T	Foetal	+	P.S.	+s	+	+	...	...	...	...	No history save of frequent Bronchitis.
†M	8	F	...	E.B.(v)	...	...	+	+	+	+	...	...	...	Tonsils + +.
F	8	...	T	Foetal	...	...	+	...	...	...	...	...	...	Emotional Tachycardia.
†M	8	F	...	E.B.(v)	...	...	+	+	+	...	...	...	...	Tonsils. Septic spots.
†M	8	...	...	E.B.(v)	...	...	+	...	...	+	...	...	...	Tonsils unhealthy. Removal advised.
M	8	F	...	E.B.(v)	...	...	+	...	...	...	...	...	...	Ectopic beats every third Systole. Gross Constipation and Halitosis.
F	8	...	...	Foetal E.B.(v)	...	...	+	...	...	...	...	...	...	Marked Constipation, furred tongue, septic mouth. Halitosis.
†M	12	...	...	Foetal	...	...	S—	...	...	...	...	...	...	? Myocardial Intoxication. Recent Tonsillitis. Still has Fever.
F	12	F	T+	Foetal	...	...	+	+	+	+	...	...	Hyperthyroidism	Thyroid gland enlargement. Tremor. Proptosis, &c.
†F	13	...	...	E.B.(v)	...	...	+	...	...	...	...	S at P.	Haemic Bruit	Alopecia Areata and Leucoderma.
†M	12	...	...	E.B.(v)	...	...	S—I	...	...	...	...	S at M. & P.	Haemic Bruit	Very obese boy.
†F	12	F	T	E.B.(v)	...	...	+R	+	...	...	...	S+D.M.C.P.	Ex. P.P.	Old Rickets, scrofulous scars, injected throat.
†F	13	F	T	Foetal	...	...	S—p	+	...	...	...	...	...	Tonsillitis. Temp. 99.2°F. Spleen palpable. Myocardial toxæmia.
F	13	F	T+	Foetal	...	...	+I	...	...	...	...	...	...	Had Tuberculous Arthritis of knee joint at time of examination.

TABLE IIa.

PHYSICAL SIGNS IN CASES OF CONGENITAL ORGANIC HEART DISEASE.

Sex.	Age.	Apex.	Rate.	Rhythm.	Enlargement.	Thrills.	M1.	M2.	P2.	A2.	T2.	Bruits.	Diagnosis.	REMARKS.
M	7	...	...	...	...	...	Normal	...	...	...	...	S at A.C.B.	Septal Lesion ?	Clubbed Fingers. Riedel's Lobe of Liver.
F	8	F	...	...	...	S+D B	+	...	++	...	...	S+D at C.B.	Patent Ductus Arteriosus	Confirmed by Electrocardiography.
M	12	...	...	...	...	...	+I	...	...	...	...	S.c. at C.	Septal Lesion ?	Also Congenital Cataracts. Clubbed Fingers.
F	13	...	...	...	...	...	Normal	...	...	...	...	S.c. at P.	Septal Lesion ?	Cold, blue extremities. Cyanosis slight.
M	12	F	...	...	+	...	+I R	...	...	...	...	S. at A.C.	Septal Lesion ?	No clubbing observed. Mongolian Facies. Tonsils ++.

TABLE IIb.

PHYSICAL SIGNS IN CASES OF ORGANIC HEART DISEASE (ACQUIRED).

M	8	...	...	...	...	P.S. at C	+s	+	...	...	...	P.S. and S.	Early Mitral Disease	Pigeon breast, mouth breather. Adenoids. R. Tonsil ++.
F	8	F	...	...	+	...	S-I	+	+	...	...	S. at A.	Acute Endocarditis	Tendency to fidget.
F	10	...	T	...	+	...	+p	+	+	...	...	S. at A.C.B.	Mitral Disease ...	Growing pains. Hutchinson's Subcutaneous nodules.
M	9	...	T	...	...	P.S.	+p	...	-	...	...	S.(f) P.S. at A.	Early Mitral Disease	Tonsils very unhealthy. Septic spots.
M	9	F & D	T++	...	+++	D & P.S. c	+	...	...	-	...	S. & D. at A.C.B.	Adherent Pericardium...	No Etiological history.
F	12	...	...	...	+	...	+s	+	+	...	...	S.(f) at M. & B.	Aortic Incompetence Mitral Endocarditis	" Brought on by shock." !!
M	12	F	T	...	...	P.S.	++	...	+	+	...	.....	Mitral Endocarditis	Referred to own Doctor.
F	12	F. & D	...	...	+++	D.(f) at C.	e.p. +	...	...	+p	...	S. at B. & A. D.(f) at B.C.A.	Aortic Incompetence	Will not play games.
F	12	F	...	...	++	...	+	...	...	-	...	D.(f) at B.A.C.	Aortic incompetence	Choreic, Capillary Pulsation (Retinal vessels). Growing pains at times.
F	13	...	...	...	+	...	+	+	+	...	...	S.(c) at A.	Mitral Disease ...	Growing pains the only history.
F	13	F	...	...	+	P.S.	+	+	+	...	...	P.S. & S. at A.	Mitral Disease ...	Growing pains. Tonsils+.
F	13	F	...	...	...	...	+	...	...	...	...	S. at A. B. & Scapula	Mitral Disease ...	History of both Rheumatic Fever and Chorea.
F	13	F	...	...	+	...	+p	R	...	...	...	S. & D. at A.	Mitral Disease ...	Tonsils++.
F	12	...	...	...	+	...	...	...	...	...	...	S. at A.C. & scapula	Mitral Disease ...	Growing pains and recurrent sore throats.
F	12	...	...	...	+	...	...	...	...	...	...	S. at A.C. & scapula	Mitral Disease ...	Poor quality of first mitral sound previously noted.

TABLE III.

PHYSICAL SIGNS IN CASES PRESENTING FUNCTIONAL BRUITS.

Sex.	Age.	Apex.	Rate.	Rhythm.	Enlarge- ment.	Thrills.	SOUNDS.					Bruits.	Diagnosis.	REMARKS.
							M1.	M2.	P2.	A2.	T2.			
F	7	...	T	...	...	...	...	...	...	...	...	S. M. & P.	En. H.	Very septic mouth—Pyorrhoea alveolaris.
F	9	F	T	...	...	...	+	...	...	...	...	S. C.	Ex. P.P.	Asthma.
F	9	...	T	...	+	...	...	...	+	...	...	S. M.	En. H.	Chronic Bronchitis.
†F	8	...	T	...	...	...	...	...	...	...	...	S. M.C.P.	En. H.	Marked Toxaemia from Tonsils. Also Bronchitis.
F	9	...	...	...	...	...	...	...	...	...	...	S.(f) P.	En. H.	Anaemia. Very tall for age.
F	10	F	T	...	...	...	...	...	...	...	...	S. M. C. P.	En. H.	None.
M	8	F	...	...	...	...	+	...	+	+	...	S. P.	En. H.	Slight Thyroid Enlargement.
M	8	F	T	...	...	...	+R	...	...	...	...	S.(f) B.	En. H.	Eight layers of clothing.
M	8	...	...	...	...	...	...	...	...	...	...	S. B.	En. H.	None.
M	8	...	...	...	...	...	...	...	...	...	...	S. A.	En. H.	Probably Physiological Bruit.
F	8	...	...	...	...	...	S— I	+	+	...	...	S. A.	Ex. C.P.	Generalised Bronchitis and Emphysema.
F	9	...	...	...	...	...	...	...	...	...	...	S. B.	Ex. C.P.	None.
F	9	...	...	...	...	...	...	...	...	...	...	S. M. C. P.	En. H.	Slight Thyroid Enlargement. History of Growing Pains.
F	9	...	...	...	...	...	+	+	...	...	...	S. C.	En. P.	Physiological Bruit.
F	10	...	...	...	...	...	...	...	...	...	...	S.(f) C.	En. P.	Bruit best heard over Tricuspid Area. Physiological.
F	8	...	...	...	...	...	...	...	...	...	...	S. P.	En. H.	None.
†F	8	...	...	...	...	...	+	...	...	...	...	S. P.	En. H.	Tonsils+++.
†F	7	...	...	...	...	...	+	...	...	...	...	S.(f) A.	Ex. C.P.	“Fidgety.” Teacher suggested Chorea.
F	8	...	...	...	...	...	...	+	...	...	...	S. A.	En. H.	All heart sounds distant. Emphysema.
F	8	...	...	...	...	...	+	+	...	...	...	S.(s) A.	Ex. C.P.	Diffuse Bronchitis.
F	8	...	T	...	...	...	...	...	...	...	...	S. B.	En. H.	Simple Tachycardia (Emotional).

TABLE III. (Continued).

Sex.	Age.	Apex.	Rate.	Rhythm.	Enlarge- ment.	Thrills.	SOUNDS.					Bruits.	Diagnosis.	REMARKS.
							M1.	M2.	P2.	A2.	T2.			
M	8	...	...	...	...	...	...	+	+	...	...	S.(f) P.	En. H.	None.
†F	13	...	...	E.B.(v)	...	...	+	...	...	...	...	S. P.	En. H.	Alopecia Areata and Leucodermia.
F	13	F	...	...	...	...	+	...	+	+	...	S. P.	En. H.	Double Otorrhœa.
F	13	...	...	...	...	...	...	...	+	+	...	S. M. & P.	Ex. C.P.	Bronchitis.
F	13	F	...	...	...	...	+	...	...	...	...	S. M. & P.	En. H.	Slight Thyroid Enlargement.
M	12	...	...	...	...	...	...	...	...	...	...	S. P.	En. H.	None.
M	13	...	...	...	...	...	...	...	...	...	...	S. M.	En. H.	Slight Thyroid Enlargement.
M	13	...	...	...	...	...	...	...	...	...	...	S. M.	Ex. C.P.	None.
†M	12	...	...	E.B.(v)	...	...	S— I	...	...	...	...	S. M. & P.	En. H.	Very Obese Boy.
M	13	...	...	...	...	...	...	...	...	...	...	S. B.	En. H.	Slight Thyroid Enlargement.
M	12	...	...	...	...	...	...	...	...	...	...	S. A.	Ex. C.P.	None.
M	12	...	...	...	...	...	...	...	...	...	...	S. B.	En. H.	History of growing plains.
M	12	...	T	...	...	...	R	...	...	...	...	S.(f) B.	En. H.	Simple Tachycardia.
M	13	...	...	...	...	...	...	...	...	...	...	S. M.	En. H.	None.
M	12	...	...	...	...	...	...	...	...	...	...	S. M.	En. H.	Small. Delicate. No Anaemia.
F	13	...	...	...	...	...	...	...	...	...	...	S. P.	Ex. C.P.	Evidence of old Rickets. Bronchitis.
F	13	...	...	...	...	...	...	...	...	...	...	S. M. C. P.	En. H.	Rheumatic Family History.
††F	12	F	T	E.B.(v)	...	...	+R	+	...	...	...	S. & D. M. C. P.	Ex. P.P.	Old Rickets. Scrofulous Scars. Injected throat.
F	13	F	T	...	...	...	I	...	...	...	...	S. M. & B.	En. H.	Dirty, uncared-for, malnourished.
F	13	F	T	...	...	...	+	...	+	+	...	S. M. C. B.	En. H.	Emotional Tachycardia.
†F	13	...	...	...	...	...	S—	...	...	...	...	S. A.	Ex. C.P.	Kyphosis. Injected throat. Flat upper lobes.
F	13	...	...	...	...	...	...	...	...	...	...	S. B.	En. H.	High grade Myopia (—7D.).

TABLE III. (Continued).

Sex.	Age.	Apex.	Rate.	Rhythm.	Enlarge- ment.	Thrills.	SOUNDS.				Bruits.	Diagnosis.	REMARKS.
							M1.	M2.	P2.	A2.	T2.		
M	12	F	T	...	...	...	+	...	...	...	...	En. H.	Bronchitis. Adenoids. Mouth Breather.
M	12	F	...	...	+	...	...	...	...	...	...	En. H.	No Etiological history.
M	14	...	...	...	+	...	...	...	...	...	...	En. P.	Possibly congenital, but no other signs.
F	13	...	...	...	...	...	...	...	...	...	...	En. H.	None.
†F	13	...	T	...	...	...	†S	...	...	...	...	En. H.	Throat—unhealthy appearance. Scabies.
F	11	F	...	...	+	...	+	...	+	...	...	En. P.	Unresolved Pneumonia Rt. base.
F	12	F	...	...	...	...	+	...	...	...	...	En. H.	Seven layers of clothing.
F	12	...	...	...	...	...	No note.	...	...	...	...	Ex. C.P.	No note of heart sounds in this case.
F	14	...	...	...	...	...	...	...	...	...	...	En. H.	None.
F	14	F	T	...	...	...	+	+	...	+	...	En. H.	Tachycardia intense. Emotional. Thin. Phthinoid type of chest.
F	12	...	...	...	...	...	...	...	+	...	...	En. H.	Some Bronchial Catarrh.
F	14	...	...	...	...	...	...	...	...	...	...	En. H.	None.
F	14	...	...	...	...	...	†P	+	...	...	...	En. H.	Adenoids. Double Otorrhœa. Kyphosis. Dermatographism.
F	13	F	...	...	...	...	...	...	...	...	...	En. H.	Bronchitis. Frequent sore throats. Tonsils seem healthy.
F	12	...	...	...	...	...	...	...	...	...	...	En. H.	Nephritis 7 years ago. A 2 normal. B.P. not raised.
†M	13	...	...	...	...	...	S— P	...	...	...	...	En. H.	Pale. Both Tonsillar glands+.
M	13	...	...	...	...	...	...	...	...	...	...	En. H.	None.
M	14	F	...	...	...	...	...	...	...	...	...	En. H.	Pigeon chest. Lordosis. Old Rickets.
F	13	...	T	...	...	...	+	...	...	...	...	En. H.	Emotional Tachycardia.
F	13	F	...	...	...	...	+	...	...	...	...	En. H.	Thin chest wall. Harsh Breath sounds.
F	13	...	T	...	...	...	+	...	+	...	...	Ex. C.P.	Post Pneumonic Pulmonary Fibrosis. Clubbed fingers.

TABLE IV.

PHYSICAL SIGNS IN CASES PRESENTING VARIATIONS FROM NORMAL OF THE CARDIAC SOUNDS (NO BRUITS).

Sex.	Age.	Apex.	Rate.	Rhythm.	Enlarge- ment.	Thrills.	SOUNDS.					REMARKS.
							M1.	M2.	P2.	A2.	T2.	
F	8	...	...	...	...	...	...	+	...	...	...	Chronic Bronchitis.
F	8	...	...	...	...	...	...	+	...	...	...	Kyphosis. Flat chest. Bronchitis.
F	9	...	...	...	...	...	+	+	...	+	...	Tonsils+. Apical Bronchitis. ? Phthisis.
F	8	...	T	...	...	...	+	+	...	...	...	Chronic Bronchitis.
F	8	F	T	...	+	...	+I	...	...	...	...	Apical Bronchitis.
F	7	...	...	...	...	...	...	+	...	...	...	Slight Thyroid Enlargement.
F	10	...	...	...	...	...	...	+	...	+	+	Very thin chest wall. Emotional also.
F	9	F	...	...	...	...	+I	+	+	...	...	Slight Bronchitis.
F	9	F	T	...	...	...	+	+	...	...	...	Congenital Ichthyosis.
F	8	...	...	...	...	...	...	+	...	...	...	Chronic Bronchitis. Enlarged Bronchial glands.
F	8	...	...	...	...	...	...	+	...	...	...	Slight Anaemia.
M	8	F	...	...	...	...	+I	...	+	+	...	Pigeon chest. Old Rickets. Some Anaemia.
M	8	...	...	...	...	...	+	+	...	...	...	Marked Bronchitis. Tonsils++ and unhealthy.
M	8	...	...	...	...	...	S— I	+	+	+	...	Gross Anaemia, but no bruits. Liver++. Spleen impalpable.
M	8	...	...	...	...	...	...	R	...	...	...	Slight Bronchitis.
F	8	...	...	...	...	...	+	...	...	...	...	Slight Thyroid Enlargement.

TABLE IV. (Continued.)

Sex.	Age.	Apex.	Rate.	Rhythm.	Enlarge- ment.	Thrills.	SOUNDS.					REMARKS
							M1.	M2.	P2.	A2.	T2.	
†F	8	...	...	...	...	...	...	R	...	...	...	Tonsils+. Mouth breather. Tonsillar glands++.
F	8	...	...	...	...	...	...	+	+	+	+	T.B. Glands neck. Creps. R. Apex. Throat very unhealthy.
M	8	...	...	...	...	...	...	...	R	...	...	Child apparently healthy in every way.
M	9	F	...	...	...	...	+	...	...	...	...	Nephritis one year ago. Headaches very marked.
F	8	F	T	...	...	...	++s	...	...	...	...	Highly nervous child. Frequency = 160 per min.
F	7	...	...	...	...	...	+I	...	...	...	...
†F	8	...	T	...	...	...	I	...	...	...	...	Suffered from recurrent Tonsillitis. Otherwise nil to note.
†F	8	F. & D	...	...	...	...	+	R	+	...	...	Some Anaemia. Tonsils+ and unhealthy. Tonsillectomy.
F	8	...	...	...	...	...	+	...	...	...	...
M	8	...	...	...	...	...	...	+	...	...	...	Diffuse Bronchial Catarrh.
M	8	...	...	...	...	...	...	...	+	...	...	Tonsils+. Have been guillotined. Double Otorrhœa. Nasal Catarrh.
M	8	...	...	...	...	...	...	...	+	...	...
M	8	...	...	...	...	...	R	+	...	+	...	Cold, clammy extremities. Diffuse Bronchitis.
F	12	...	...	...	...	...	...	+	+	...	...	Old Rickets.
F	12	...	...	...	...	...	...	...	...	+	+	Mouth breather. Diffuse Bronchitis.
F	12	F	T	...	...	...	+	...	...	+	...	Hyperthyroidism.
F	12	F	T+	...	...	...	+	+	+	+	...	Hyperthyroidism. Tremor, Exophthalmos, Sweating, &c.
F	12	...	...	...	...	...	S—	...	+	+	...	Basal Bronchitis.
F	13	...	T	...	...	...	+	...	...	...	...	Unusually well developed girl.
M	12	...	...	...	...	...	+	...	+	+	+	Very thin. Undernourished.
M	12	...	...	...	...	...	...	+	+	+	+	Well marked Emphysema.
M	12	F	...	...	...	...	+	+	+	+	...	Small stature. Thin. Emphysema.

TABLE IV. (Continued).

Sex.	Age.	Apex.	Rate.	Rhythm.	Enlarge- ment.	Thrills.	SOUNDS.					REMARKS.
							M1.	M2.	P2.	A2.	T2.	
M	12	...	...	...	...	...	...	+	...	...	...	Slight Kyphosis and flat chest.
M	12	...	...	...	...	...	...	+	...	...	...	Pale. No gross Anaemia.
F	13	...	...	...	...	...	...	...	+	...	...	Slight Thyroid enlargement.
F	13	F	T	...	+	...	S—	+	...	...	...	Marked Bronchiectasis. Halitosis.
†F	12	...	...	...	...	...	+I	...	+	...	...	Rt. Tonsil+ and infected.
F	14	...	...	...	...	...	+s	+	...	...	...	Fibroid L. Lung. Scrofulous scar in neck. Mother in Sanatorium.
†F	12	...	...	...	...	...	+p	R+	...	...	...	Tonsils. Chronic Fibrotic Hypertrophy. Some Adenoids.
†F	13	...	T	...	...	...	S—p	—	...	...	—	M1 very muffled. Diphtheria three years ago. Tonsils unhealthy.
F	13	F	T	...	...	...	+s	...	...	...	...	Emotional Tachycardia.
F	13	...	...	...	...	...	+	...	...	...	...	Erb's Palsy. Has had Diphtheria, Scarletina and Measles.
F	13	...	...	...	...	...	+	...	...	+	+	Slight Bronchitis only.
F	12	...	...	...	...	...	...	...	...	++	...	Nothing found to account for this marked accentuation.
F	13	...	T	...	...	...	+	...	...	...	...	Thin chest wall.
F	13	...	...	...	...	...	+	+	...	+	+	Hilum Tuberculosis. Emaciated.
F	12	...	...	...	...	...	...	+	...	+	...	Slight Thyroid enlargement.
†F	12	...	...	...	...	...	+	R	...	...	...	Tonsils+ +. Deep crypts. Suggested removal.
†M	12	...	...	...	...	...	+	+	+	+	...	Both Tonsils+ + and "craggy." Both Tonsillar glands—.
†M	13	...	...	...	...	...	+I	+	+	+	...	Nothing found to account for impurity of M1.
M	12	...	...	...	...	...	...	+	...	...	...	Tonsils injected. Tonsillar glands+. Marked post nasal catarrh.
M	13	...	...	...	...	...	...	+	...	+	...	Scarlatina aged 8. Otorrhoea since. Tonsils+.
M	12	...	...	...	...	...	+p	...	...	...	...	Old Rickets. Flat chest. "Fnnelled" sternum.

SUMMARY.

No. of Cases examined	...	...	$\left\{ \begin{array}{l} \text{Girls} = 740 \\ \text{Boys} = 764 \end{array} \right\}$	Total 1,504.
No. of Cases showing Disorders of Rhythm	...	...	$\left\{ \begin{array}{l} \text{Girls} = 10 \\ \text{Boys} = 6 \end{array} \right\}$	Total 16 = 1.06%
No. of Cases with Organic Heart Disease	...	...	$\left\{ \begin{array}{l} \text{Girls} = 11 \\ \text{Boys} = 8 \end{array} \right\}$	Total 19 = 1.26%
(a) Of congenital origin	...	...	$\left\{ \begin{array}{l} \text{Girls} = 2 \\ \text{Boys} = 3 \end{array} \right\}$	Total 5 = 0.33%
(b) Of acquired origin	...	...	$\left\{ \begin{array}{l} \text{Girls} = 9 \\ \text{Boys} = 5 \end{array} \right\}$	Total 14 = 0.93%
No. of Cases showing functional bruits			$\left\{ \begin{array}{l} \text{Girls} = 43 \\ \text{Boys} = 21 \end{array} \right\}$	Total 64 = 4.26%
No. of Cases showing variations of heart sounds only	...	...	$\left\{ \begin{array}{l} \text{Girls} = 44 \\ \text{Boys} = 22 \end{array} \right\}$	Total 66 = 4.39%
No. of Cases under suspicion of having early organic disease	...	...	$\left\{ \begin{array}{l} \text{Girls} = 17 \\ \text{Boys} = 7 \end{array} \right\}$	Total 24 = 1.6%
Total No. of "Functional" hearts (including disorders of Rhythm)	...	...	...	= 77 = 5.12 %
Age-Sex incidence of "functional" bruits	...	...	$\left\{ \begin{array}{l} \text{Girls (7-10 years)} = 17 \quad \text{(11-14 years)} = 26 \\ \text{Boys (7-10 years)} = 5 \quad \text{(11-14 years)} = 16 \end{array} \right\}$	Total = 43 Total = 21

Analysis of Functional Bruits.(a) *Origin.*

Endocardial	$\left\{ \begin{array}{l} \text{Haemic} = 47 \\ \text{Physiological} = 4 \end{array} \right\}$	Total = 51
Exocardial	$\left\{ \begin{array}{l} \text{Cardio Pulmonary} = 11 \\ \text{Pleuro-Pericardial} = 2 \end{array} \right\}$	Total = 13

(b) *Site (Numerical order of).*

Total No. of Bruits heard at Basal Area	...	= 42
„ No. of Bruits heard at Pulmonary Area only		= 25
„ No. of Bruits heard at Apex = Mitral Area		= 34
„ No. of Bruits heard at Precordial centre	...	= 13
„ No. of Bruits heard over whole Precordium	..	9

Analysis of Heart Sounds. Tables III and IV.

(a) Numerical Order of Variation.

M1	Abnormal	...	=	65	Normal	...	...	=	65
M2	"	...	=	47	"	...	...	=	83
P2	"	...	=	33	"	...	...	=	97
A2	"	...	=	28	"	...	...	=	102
T2	"	...	=	10	"	...	...	=	120

(b) Analysis of Variation.

	+ or ++.	Impurity.	Reduplication.	Other Variations.
M1	45	16	4	...
M2	41	...	5	1
P2	32	...	1	...
A2	28	...	...	...

(c) Comments regarding above Table (b).

1. Of the Cases showing impurity of the " Mitral " 1st sound ... { 8 showed "softening" and impurity.
5 " accentuation and impurity.
3 " impurity only.
- Do. do. do. { Associated with chest lesions (Bronchitis and Bronchiectasis) 5
With evidence of throat sepsis ... 4
With thyroid enlargement ... 1
With obesity ... 1
With anaemia ... 1
With malnourishment ... 1
With Diphtheria ... 1
No note ... 2
2. Of 4 Cases showing reduplication of the " Mitral " 1st sound :—
1 had diffuse bronchitis.
1 had eight layers of clothing (Simple tachycardia).
1 had simple tachycardia.
1 had evidence of old rickets, scrofula and an unhealthy throat.
1 had slight bronchitis.
3. Of 5 Cases showing reduplication of the " Mitral " 2nd sound (in all of these no bruits were audible) :—
4 had evidence of an unhealthy throat condition.
1 had slight bronchitis.

CONCLUSIONS.

1. The incidence of Organic Heart Disease in the children examined is higher than that found in over 500,000 children in 1924, being 1·1 per cent, as against 0·7 per cent. (Vide Ministry of Health Report No. 44, page 43).
2. The ratio of Congenital to Acquired Disease is high (20 per cent.) as against that of London (14 per cent.) and Bristol (13 per cent.), but is on a par with that of Glasgow (1924-5).
3. Disorders of Rhythm constitute a considerable portion (21 per cent.) of the Functional Lesions. Ectopic Beats alone constitute about 10 per cent. of these lesions. It is interesting to note that five out of the eight cases exhibiting Ectopic Beats occurred in boys. Of these five, three were associated with Throat Sepsis, one with gross constipation, and one with obesity. In one instance Ectopic Beats occurred in association with Tachycardia.

4. A very high percentage of the cases examined shewed Functional Bruits (4.3 per cent.). It is submitted that this may be due to the fact that auscultation was carried out at six areas. Girls shewed a distinct numerical preponderance in these cases, the ratio being 2/1. This ratio seems to be more marked at the earlier age period (7-10) (3/1), and less so at the later age period (11-14) (2/1). In order of frequency Functional Bruits are heard at the Base, Apex and Centre of the Pre-cordium.

5. 4.4 per cent. of the cases examined shewed a definite variation from normal of the Cardiac Sounds, without exhibiting any bruits. It is interesting to note that the sex ratio Girls/Boys in this group is almost identical with that found in the group with Functional Bruits (2/1 ratio), and approximates to the sex ratio found in the Organic Group (3/2).

6. On analysis of the foregoing Tables, it is found that :

(a) In a large percentage of these cases the anomalies are associated with some definite pathological focus in throat or chest, with Thyroid enlargement, with Rickets, Scrofula, Anaemia, or other conditions which, either as cause or effect, produce in the subject an intoxication only too obvious to the clinical senses. It is submitted that such intoxications are very frequently evidenced by alterations in the Cardiac frequency, rhythm, and sounds : that such alterations, especially of the first and second " Mitral " sounds, warrant the assumption that the Heart is either irritable or depressed, and is working in a toxic medium : that its local immunity is thus lowered : and that therefore the rational course is that which advises temporary rest for the Heart, and, where possible, the early neutralisation of the toxin, whether exogenous or endogenous. It is contended that in no case should the child in whom *any* Cardiac anomaly is found be allowed to retain *any* septic focus, especially if such be constituted by unhealthy Tonsils or Adenoids.

(b) Definite variation from the normal Heart Sounds occurs in a large number of children in whom there is no definite evidence of Organic Heart Disease, and who exhibit no bruits of any kind.

7. It is submitted that, in children who present history, symptoms, or signs, of a Rheumatic diathesis, the quality of the Cardiac Sounds is deserving of the closest attention : that variation from normal should be seriously regarded : and that therapeutic measures should be instituted even in the absence of other signs of Cardiac involvement.

Dr. F. Hall gives a short report on the Results of Light Treatment at the Westhoughton Clinic.

A REPORT ON THE RESULTS OF THE LIGHT TREATMENT AT THE WESTHOUGHTON CLINIC.

During the two months, while the treatment has been available, fourteen school children have been treated.

The Lamps are of the Mercury Vapour type (Hewittic-Levick) and radiation, both general and local, has been given, under the supervision of Dr. Leigh, M.O.H., Westhoughton.

The commencing dose was in all cases 2 minutes at a distance of 3 feet, and this was gradually increased by 1 minute at each session to a maximum of 15 minutes at the same distance, the whole body surface being exposed.

In cases 1, 2 and 4 (below) local treatment was administered.

In none of the cases did the treatment cause Erythema, nor were any adverse effects noticed.

Nine of the cases were children between the ages of 7 and 9 years (3 girls, 6 boys). These all presented the same condition at the beginning of treatment. They were pale, tired looking children, definitely under-nourished and with signs of previous rickets.

The effect of the treatment (an average of twenty radiations was given) was, that although there was no appreciable gain in weight, the children appeared to benefit by the treatment. They looked better and were more lively. In each case the parent reported an improvement in the child's general health.

These nine cases will be kept under observation and their condition noted three months after treatment has ceased.

In the remaining five cases more definite effects were noted.

1. Girl aged 6 years. Very severe Impetigo of face. Five radiations, local and general, were given and the condition was cured, the child being fit to return to school in two weeks.

2. Boy aged 13 years. Extensive Furunculosis, particularly of the thighs and buttocks. Child appeared very ill.

A rapid improvement was effected and the condition was completely cured by ten general radiations.

During the treatment the boy lost 6 lbs. in weight.

3. Boy aged 10 years. Extensive Ichthyosis, existing from an early age. Fourteen radiations have so far caused a most marked improvement.

4. Girl aged 12 years. Submental Adenitis, with a long thick Keloid Scar. Local and general radiation has been given for two months. The Adenitis has almost disappeared and the scar shows a very pronounced diminution.

This child has gained 6 lbs. during the treatment.

5. Girl aged 5 years. A cross, flabby child, with well-defined symptoms of active Rickets. Liver much enlarged.

No gain in weight, but there is a totally different picture. The child is happy and active, the liver is normal and there is no sweating.

Conclusions.

The period under review is too short to form any definite opinion upon the real value of Ultra Violet Radiation in a school clinic.

The effects noted are sufficiently encouraging to pursue the treatment, and the course decided upon of giving small and very carefully graduated, radiations will be continued, the cases being followed up and the ultimate results recorded and submitted in a later Report.

Dr. J. A. Tomb reports the result of Schick Testing and Diphtheria Inoculation in District 1.

REPORT ON SCHICK TESTING AND DIPHTHERIA INOCULATION IN DISTRICT 1.

The village of Askam, near Dalton in Furness, contains two Elementary Schools. The Junior and Infant Council School with an average attendance of 212 and the Senior Council School with an average attendance of 291 had, during the years 1918-1927 constantly recurring outbreaks of Diphtheria among the pupils, the outbreaks occurring at irregular intervals with longer and shorter periods of intermission. The most severe outburst occurred in the early spring of 1927, when about a dozen cases were reported, all severe and three of them fatal.

After consultation with the local Medical Officer of Health, Dr. G. H. Patterson, of Ulverston Rural District, it was recommended that the children attending the two schools and the other children in the village, under school age, should be inoculated. All the materials necessary were supplied by the County Authority.

Askam is a poor district, chiefly inhabited by iron ore miners and Barrow shipyard workers, many of them unfortunately, unemployed for very long periods. The parents, although anxious on the children's behalf, were not in a position to understand easily the reason for the proposed inoculation and it was necessary to conduct vigorous propaganda before their consent could be obtained.

The first step was to print circular letters which were sent to every parent, stating that the disease was preventable and asking for the parents' written consent to the inoculation of the children. In addition, two of the Health Visitors

visited each family to to re-inforce the arguments in favour of the procedure. As they met with many objections it was thought wise to call a meeting of the parents and teachers to be held in the school-room and Dr. Patterson and the local medical practitioners were asked to be present to support the scheme. These duly attended and there was a very satisfactory attendance of parents, both fathers and mothers, who listened carefully to the address. In the end 60 per cent. of permissions were obtained, the others remaining obdurate.

The Infant School children (up to 8 years), were the first to be treated. Without any skin test each child was given a weekly dose of 1 c.c. Burroughs Wellcome "Diphtheria Prophylactic" for three weeks. The skin test (Schick Test) was omitted in this school for various reasons :—

- (a) Probable high percentage of "positives."
- (b) Difficulty of making the parents understand what the skin test meant and that it did not mean inoculation.
- (c) Children seemed to resent the intra-dermal skin test, while they did not resent the hypodermic inoculation. (This also applied to members of the Staff who were tested). There was, as a matter of fact, no case of severe reaction to inoculation among all who were done.

In the Senior School (children up to 14 years), all children over 10 years were submitted to the Schick test. Up to that age the inoculation was proceeded with without the skin test. Over 10 years the percentage of "positive" reactors was 25% (this percentage was only what could be expected in a community so thoroughly "salted."). The three inoculations of all the "positive" reactors were completed and as a "safety precaution" all "negative" reactors were given *one* inoculation of prophylactic.

In this school there were two boys (they were cousins) of about 10 years of age who reacted very severely to the skin test, with very marked hyperaemia of the skin area, sickness, headache, muscular weakness and faintness. This lasted about 24 hours. As there was, in each case, a very pronounced pseudo-reaction in the "control" arm the symptoms were attributed partly to protein sensibility. In these two children the skin reaction was so severe that the inoculation proper had to be omitted.

In the case of the members of the teaching staffs, who wished to be immunised, the ordinary routine inoculation was preceded by a dose one tenth strength and hyper-sensibility reaction was watched for, but did not occur.

The material used was Burroughs Wellcome "Diphtheria Prophylactic" for inoculation and "Schick Test Toxin" for skin testing.

In addition to children at school, many children under school age, were inoculated either at the school, or afterwards at the neighbouring Infant Welfare Centre at Dalton-in-Furness.

The results, as proved after two years, have been eminently satisfactory. Diphtheria has practically disappeared, not only amongst the school children, but also in the village generally.

Dr. I. F. McAsh contributes a paper on Oral Sepsis and Dental Caries in school children.

ORAL SEPSIS AND DENTAL CARIES IN SCHOOL CHILDREN.

The condition to which the term oral sepsis is applied may be present without dental caries, but it is inconceivable that dental caries could be present in a mouth for long without oral sepsis supervening. The two conditions are present only too often in the mouths of our Elementary School children.

A better term for the primary stage of oral sepsis is that used by Sim Wallace, namely, oral mal-hygiene, for it is from neglect of the principles of dental hygiene that a great deal of dental disease is due, and it is from this starting place that so many of the ailments and diseases affecting the school child, and later the adult, arise.

In young children, septic conditions of the teeth are exceedingly common arising as a rule from infection of the tooth pulp, with resulting periodontitis and abscess formation. Deciduous teeth are much more liable to septic complications than permanent teeth, and it is no uncommon sight to see a child of five years of age with two or three dental abscesses in varying stages of chronicity.

In children of from 12 to 14 years of age, oral sepsis may be present apart from dental caries. This simply means that the child has an unhygienic mouth, that the teeth are rarely or never cleansed, but that the teeth themselves are free from decay. If the dirty habits are allowed to continue, caries usually supervenes.

Undoubtedly ante-natal influences and heredity play a great part in determining the liability of the teeth to caries.

Mrs. May Mellanby has done a great deal of investigation into the question of the structure of teeth and its effect in regard to the onset of caries, and she has found that on the whole the poorer the quality of the teeth the more likely are they to become carious. In addition, she has stated that the structure of the child's teeth depends to a very large extent on the diet of the mother before the birth of the child, and later on the diet of the child.

Oral sepsis affects adults as well as children, but the occurrence of the condition in children is much the more serious, resulting almost invariably in weakened metabolic activity and retarded development, rendering the child an easy prey to diseases of various natures.

Examples may be seen any day in school clinics. A child will be brought to the dental surgeon by the mother ; the child has been off his food for some time and is losing weight. Or else a child is referred to the dental department by the School Medical Officer as suffering from general debility, with perhaps some enlarged cervical glands. On inspection of the child's mouth, a mouthful of septic roots with perhaps two chronic abscesses with sinuses may be seen. Arrangements are made for treatment, and the mouth is cleansed of its septic and carious teeth.

Two or three months later, if inquiry is made as to the child's condition, it will be learned that he is putting on weight, takes his meals well, is brighter in school than he used to be, and generally shows an immense all-round improvement. Can it be doubted that these beneficial effects are due to the eradication of the oral sepsis.

Factors which predispose to the commencement of dental disease are irregularities of the teeth leading to the lodgment of fermenting food masses ; mouth-breathing resulting from the presence of adenoids, or a deflected nasal septum ; neglect to cleanse the teeth, leading to the formation of tartar ; and the important factor of absence from the diet of food sufficiently hard and fibrous to scour the teeth, and which by necessitating vigorous chewing strengthens and develops the jaws.

Most observers are agreed that dental caries is due to the effect on the tooth substance of an acid produced by carbohydrate fermentation, and there is no doubt that much of the dental havoc apparent in the school child of to-day is due to the tea, bread, and margarine which form the bulk of the diet in the poorer-class homes.

The practice of giving a child a soft biscuit or a sweetmeat when going to bed cannot be too strongly condemned ; this habit, which is very prevalent, is one of the chief causes of dental caries in children. Similarly, if a glass of milk is provided for the child's supper, the mouth should be thoroughly cleansed before the child goes to bed. A prevalent practice in some schools is for the children to eat a biscuit or some soft, sweet carbohydrate food at the interval in the morning lessons at eleven o'clock. The biscuit is hastily eaten, part is swallowed, and the remainder stagnates about the teeth, and is pressed into the crevices between the teeth, and into the grooves on the molars, there to ferment and produce the acid which will eat into the enamel and dentine and commence the carious process. If the children must eat something, an apple would be better for their bodily needs, and certainly better for their teeth. If soft and slushy food is eaten, the mouth and teeth should be thoroughly cleansed soon afterwards by brush and mouthwash.

In the treatment of children of pre-school age, the frequency with which caries of the maxillary incisors is noted leads one to look about for some discoverable cause of the prevalence of the condition. The use of the rubber "soother," "comforter," or "dummy," to give it some of its numerous names, would appear to have considerable bearing on the question. The comforter is frequently dipped in some fermentable substance such as condensed milk, sugar, or jam before being placed in the child's mouth, or in some cases a crust of bread dipped in milk and then in sugar is used in place of the rubber comforter.

On inquiry of the parent as to when she noticed that the child's teeth were decaying, the answer is often given that they came in rotten, or in other cases that they were black when they came in and rotted away soon after.

The belief that the teeth erupted in a carious condition is a fallacy, but it is probable that the teeth were structurally defective on eruption, and were speedily attacked by caries.

Mrs. Mellanby has stated that a large percentage of deciduous teeth exhibit defective structure on microscopical examination. Clinical observation confirms this statement, as the carious process frequently commences on the biting edge of the central incisors, a situation which in the permanent dentition is almost entirely free from caries.

Thus we come to the conclusion that even allowing for the inducement offered to disease by the sugared soother, the number of children of pre-school age exhibiting badly decayed maxillary incisors would not be so great were it not for the presence of structural defect in the teeth.

It cannot be stated definitely at present whether artificial feeding of infants, as against breast feeding, has any affect on the dental condition. While it is recognised that breast feeding, by providing the natural nourishment for the child, is, provided the mother is healthy, the most likely to ensure sound teeth, no evidence has been brought forward to show that artificial feeding, *per se*, has any deleterious effect on the teeth, always provided the feeding is carried out correctly in regard to composition of the diet and hygiene of method.

The diet of the mother before the birth of the child is of great importance. It should contain a sufficiency of mineral salts and vitamins to provide for her own needs and those of the unborn child. In addition, the dental health of the mother should receive regular attention.

A point to be noted in regard to older children is the frequency of defects in the enamel of the permanent teeth. These defects are to be observed particularly in the mandibular six-year old molars. Very often a pinhole defect will be found on the buccal surface, at the termination of the groove there. If left untreated the caries very quickly penetrates and undermines the crown of the tooth without very much external evidence.

Defects are fairly common also, in the enamel of the crowns of the premolars.

Apart from actual caries, a condition of oral sepsis may be seen, chiefly in the mouths of children of from 12 years upwards. The condition present is usually gingivitis of the marginal type; it is observed principally in the mouths of mouth-breathers, and in those mouths which show gross over-crowding.

One has not seen any cases of true chronic suppurative periodontitis, commonly called pyorrhœa alveolaris, in school children, but marginal gingivitis if untreated may be a fore-runner of pyorrhœa.

Sepsis of the primary dentition may lead to necrosis and hypoplasia of the secondary teeth, rendering them less resistant to the onset of caries. As previously mentioned, abscesses are more common in connection with the deciduous than with the permanent teeth, and the abscesses are more often open than closed, that is to say the pus quickly burrows through the bone and soft tissues, forming a sinus through which the pus and necrotic products are discharged into the mouth.

Thus the toxins are probably not discharged into the blood streams to the same extent as is the case with adults where there is often no external discharge of the products of disease.

The spread of infection in children is more by the lymphatic system, and the frequency with which enlarged lymphatic glands are associated with oral sepsis bears out the theory.

This adenitis is one of the most common findings in connection with dental disease. Primarily the glands under the jaw are found to be enlarged, soft, and tender; if the mouth condition is treated the glands may return to normal. In other cases, where the dental treatment is refused, the glands, in a few months become hard and smaller in size, indicating that although the acute condition has subsided, the glands have been left in a condition of impaired vitality, and lessened resistance. When other infections, such as tuberculosis, supervene, the glands are not in a state to combat the new disease.

This would appear to be the sequence of events in a large number of cases of tuberculous cervical glands; a cervical adenitis induced by oral sepsis and dental caries, leaving the glands with lessened resistance, followed by the entrance of the tubercle bacillus into the weakened glands where the tuberculous process is quickly set up.

Dental disease may, therefore, be regarded as an important predisposing cause of tuberculosis.

The effects of oral sepsis on the tonsils and adenoids has not yet been sufficiently investigated to justify a dogmatic statement, but it would seem that a septic condition of the mouth with constant swallowing of pus and bacteria would have an injurious effect on the tonsils.

There is no doubt that the presence of adenoidal growths with the resultant mouth-breathing, is a predisposing factor to the occurrence of dental disease, and possibly a vicious cycle may be set up in this way.

Oral sepsis is definitely associated with the anæmias, with abdominal disease, and with middle-ear disease in children, and oral sepsis dating from childhood is a cause of a great number of the chronic diseases of adult life. The list of diseases with which oral sepsis has been associated is a very long one, but the following may be mentioned:—Fibrositis, neuritis, arthritis, synovitis, lumbago and sciatica, also obscure pyrexia, anæmia, infective endocarditis, appendicitis, eye affections and mental degeneration. Special mention must be made of the close connection between oral sepsis and gastric ulcer, particularly in young girls.

As oral sepsis may be a fore-runner of tuberculosis, so may it, by its effects on the tonsils, predispose to rheumatic conditions. Diseased tonsils are frequently associated with rheumatism and allied affections, such as chorea, and the constant passage of quantities of pus and bacteria over the tonsils must, if long continued, lead to an impaired vitality, if not directly to rheumatism.

It is as the creator of a general debility and lowered vitality that dental infection plays its maleficent role in childhood. The metabolic equilibrium becomes upset, indicated by loss of appetite, constipation, irritability, dulness in school, lack of power to concentrate on lessons, loss of weight, anæmia and pallor. The child becomes thin, puny and miserable, and he is an easy prey for any disease in the neighbourhood; he contracts most of the diseases of childhood, such as measles, scarlet fever, whooping-cough, &c., and usually takes them badly.

The prevention of Dental Disease:—

Diet.

The vexed question of the form of diet which will prevent dental disease is still being investigated by a number of research workers. At present there are two main schools of thought.

One group attaches most importance to the physical nature of the foodstuffs, and the other group believes that it is in the bio-chemical composition of the diet that the essential factor lies. It is probable that the true explanation partakes of both these theories.

It seems reasonable to suppose that a badly formed tooth will decay sooner than a well formed one, provided the oral conditions are similar; and it seems equally reasonable to maintain, since we know that caries follows carbohydrate fermentation, that in a mouth that is crammed with soft, slushy carbohydrate food and rarely or never cleansed, the teeth will decay sooner than in a clean mouth, where the teeth are cleaned and exercised by a detergent, fibrous diet.

Mrs. Mellanby states that "the spread of caries in children is least on a diet containing abundant calcifying vitamin and calcium, and comparatively little cereal, none of which is oat meal, and greatest when the vitamin content of the diet is definitely less, and the cereal, some of which is oat meal, is greater."

The calcifying vitamin, or vitamin D, is a fat-soluble vitamin having a distribution and properties similar in many respects to those of vitamin A, and is present in milk, codliver oil, and egg-yolk.

The same observer states that "there is a substance present in certain cereals, and especially in oat meal, which hinders calcification."

Mrs. Mellanby's experiments tend to show that the structure of the teeth is influenced by certain constituents of the food; she also states that the resistance to caries of erupted and defectively calcified teeth can be influenced by the diet.

It is of little use, however, to draw up an elaborate diet sheet for use in poor districts, where in many cases it is a problem for the parents to provide bread alone for their children. Nevertheless, there are one or two rules which can be applied generally :—

The first solid food given to an infant, other than milk, should be in solid form, such as dry crust (not soaked in milk), or toast. Encourage chewing.

In older children food other than milk and soups should rarely be taken in liquid form. The food should be of such a nature as to compel mastication.

Do not drink with meals, but drink plenty of water between meals. If milk is taken, the teeth should be cleansed immediately afterwards.

Endeavour to finish a meal with some form of tooth-cleansing food, such as apples, oranges, lettuce, celery, radishes, or onions.

Sweets, chocolates, etc., if eaten at all, should be eaten at meal times, and the teeth cleansed afterwards. The practice of sending a child to bed with a chocolate or soft biscuit in its mouth has already been mentioned as one of the most potent factors in the production of dental caries.

The diet should include eggs, and/or cod-liver oil.

Starchy foods, such as potatoes, rice, sago, new bread, oatmeal, should be partaken of sparingly, and sugary foods such as sweets of all kinds, honey, syrup, jams, and milk should always be followed by cleansing of the teeth.

The child should be taught to employ the self-cleansing processes, namely the action of vigorous chewing, supplemented by the mechanical action of the cheeks, lips, and tongue, in removing particles of food from between the teeth. This cleansing process is helped by the saliva.

Too much importance cannot be attached to frequent examination of the teeth of children, and to this end the co-operation of the teachers is most valuable. It is an accepted fact in school medical work that a keen head teacher who is interested in the health and physical welfare of his or her scholars can assist enormously the work of school clinics, and in no other branch of the work is this better illustrated than in school dentistry.

Not only are the children themselves influenced by the teachers' attitude towards the clinic, but what is equally or more important, the parents are influenced and brought to see the benefits that accrue to them and to their children by accepting the treatment offered.

The individual interviewing of parents is of great value, and much good can be done by a few minutes explanatory talk to a mother who has brought her child to the clinic.

There is a very wide-spread ignorance of the six-year old molar, and its importance, and most parents are amazed when informed that their child aged six or seven years, has permanent teeth. They do not realize that a permanent tooth has erupted, since no deciduous tooth has been displaced.

The use of tooth-brushes, dentifrices and mouth-washes:

While the old slogan, "Clean teeth do not decay" may not be strictly true, it is certainly a fact that clean teeth and gums are more resistant to dental disease than neglected teeth.

Even on purely aesthetic grounds the use of the tooth-brush has some claims to consideration.

The habit of brushing the teeth before retiring for the night and after each meal, should be inculcated into every child as soon as possible, but care must be taken to see that the tooth-brush is used in the correct way. Incorrect methods of brushing the teeth may actually do harm.

The brush used should be small, of medium grade, and having the tufts of bristles set well apart to allow of easy cleaning and drying. As the present method of selling tooth-brushes is somewhat haphazard, it is advisable to soak the new brush in five per cent. carbolic acid for some hours before using, afterwards washing in water.

After use, the brush should be well washed in running water, dried as much as possible by shaking and placing in warm air or sunlight, and kept in a clean place, or placed in a closed receptacle such as may be purchased from most chemists, containing surgical formalin tablets.

Failing the disinfection by formalin, the brush should be placed in a five per cent. carbolic bath once a week.

Sufficient care is not taken in this matter of keeping the tooth-brush clean, and those teachers who are sufficiently interested in health matters to hold tooth-brush drill in their schools, should see that the children bring their brushes wrapped in a clean handkerchief or a clean piece of paper and not crammed into a pocket full of the usual schoolboy's odds and ends.

It is by no means uncommon to find in certain households that there is one communal tooth-brush, and even then the brush is made to perform duties for which it was never intended.

An endeavour should be made to clean each surface of each tooth. The brush should be used in a vertical direction, brushing from above downwards in the upper jaw, and from below upwards in the lower jaw. This should be done on both the buccal or cheek surface, and on the lingual or tongue surface of the teeth. The occlusal or biting surface must not be forgotten and should be brushed horizontally.

Great vigour may be employed in brushing the teeth, but if the brush is used incorrectly, the interdental spaces where food collects and caries is prone to commence are untouched, and the cleaning is so much wasted effort.; in fact if a hard brush and a gritty dentifrice are used and the buccal surfaces of the teeth brushed horizontally the surface of the teeth may become abraded.

The most important time to cleanse the teeth is just before retiring for the night, and in addition a short cleansing on rising in the morning and after each meal is recommended.

Dentifrices :

There are many excellent proprietary tooth powders and pastes on the market, and while they may not fulfil the glowing accounts of their properties set forth in the advertisements, the majority have some value as cleansing agents.

It is probable that any antiseptics contained in dentifrices can be of little value, apart from imparting a pleasant feeling in the mouth, as they are in contact with the tissues for such a short space of time, and are in such weak concentration.

Powders and pastes which contain a large amount of abrasive material should not be employed in case of damage to the tooth tissues, although correct technique in the use of the tooth-brush goes far to mitigate this danger.

It is essential that a dentifrice should dissolve mucus. Bicarbonate of soda possesses this property and makes a good dentifrice, as does common salt, although in certain mouths the latter may be slightly irritating. Precipitated chalk, obtainable very cheaply from the chemist is a good tooth cleanser and if a little bicarbonate of soda is added to it, an excellent dentifrice is to hand at the cost of a few coppers.

Mouthwashes :

Chemical mouthwashes are of value chiefly by reason of their mechanical action in washing debris from the mouth. In certain cases, as after the extraction of teeth, they may exert a soothing and astringent action, particularly if used hot ; they are also of use in dissolving thickropy mucus, in inflammation of the gums, tonsillitis, etc.

The mechanical action of swilling out the mouth with fluid, if only with plain water, is exceedingly valuable, and every brushing of the teeth should be followed by a thorough washing out of the mouth with a tumblerful of warm water, with or without the addition of a chemical mouthwash. A tumblerful of warm water to which has been added half a teaspoonful of bicarbonate of soda is a good wash.

The following figures are of interest showing as they do the improvement in the dental condition of school children brought about by Routine Inspection and treatment.

The figures are taken from the records of the Litherland school clinic.

In the years 1923 and 1924, out of 1,310 children inspected, 635 had four or more carious teeth, or 48·4 per cent.

In 1925 and 1926 the number of inspections was 644 and the number of children with four or more carious teeth was 278, or 43·1 per cent.

In 1927, 1,089 children were inspected, and the number of children with four or more carious teeth was 281, or 25·7 per cent.

In 1928 the number inspected was 1,619, and the number with four or more carious teeth was 414 or 25·5 per cent.

The ages of the children inspected ranged from five to fourteen years.

Dr. H. L. Cronk sends some notes on Child Welfare Work in the Districts of Audenshaw and Droylsden and another article on the Prevalence of Rickets in Area 35.

NOTES ON CHILD WELFARE WORK IN THE DISTRICTS OF AUDENSHAW AND DROYLSDEN.

The present notes are concerned with some of the results of the Child Welfare Work done in the districts of Audenshaw and Droylsden. Child Welfare Work can be conveniently divided into two parts (1) ante-natal, concerned with producing a healthy infant; and (2) post-natal, concerned with keeping that infant healthy.

1. *Ante-natal supervision* aims at a natural labour with avoidance of instrumental or other interference, a normal convalescence and a healthy, breast-fed infant.

Table I gives details with regard to the pregnancies terminated in Audenshaw and Droylsden between January 1st and December 31st 1927. This information is provided by the Health Visitors for these Districts, who have abstracted the information from their notebooks. The marked excess of instrumental deliveries and some inability to start breast feeding satisfactorily in Audenshaw are the most noteworthy features of this table. There is also shown some excess of premature births in Audenshaw and of stillbirths in Droylsden.

Table I.

Condition.	AUDENSHAW. No. of pregnancies completed in 1927 = 123.		DROYLSDEN. No. of pregnancies completed in 1927 = 169.	
	No.	% of pregnancies.	No.	% of pregnancies.
Stillbirths	3	2·4	8	4·7
Instrumental labour	16	13·0	1	0·6
Maternal sepsis	2	1·6	3	1·8
Other maternal complications	Unknown*		5	3·0
Premature births	6	4·9	2	1·2
Inability to establish breast-feeding	14	11·7†	14	8·7
Total No. of pregnancies with one or more complica- tions	39	31·7	28	16·6

* Eight mothers needed stitching for torn perineum after normal labour and seven after instrumental.
† Percentage of live births.

- Notes :—1. The pregnancies referred to are those completed in the districts in 1927; this number does not include those taking place in hospitals, etc.
2. The cases of puerperal sepsis in Audenshaw, of whom one died, were both instances of “puerperal fever”; of the cases in Droylsden one was “puerperal fever” and two thrombosis, with no deaths.
3. The other complications among Droylsden cases were 3 mothers with ruptured perineum and 2 with mammary abscess. Table 2 gives the antenatal and neonatal mortality in these two districts.

Table II.

	AUDENSHAW.		DROYLSDEN.	
	No.	%	No.	%
Pregnancies	123		169	
Stillbirths	3	2.4	8	4.7
Deaths under 1 month ...	3	2.5	5	3.1
		of live births		of live births

Note :—Of the neonatal deaths in Audenshaw all 3 were of premature babies ; of those in Droylsden, 2 were of premature babies, one mother having had antenatal supervision from a midwife and one not, and of the other 3, 2 died of convulsions and inanition, and one of sepsis, these three having had no antenatal supervision.

There is no organised scheme for *antenatal work* in Audenshaw, such antenatal work as is done being carried out by the women's own doctor. In the vast majority of cases the doctor is only consulted for some special purpose, *e.g.*, varicose veins or for some ailment unconnected with pregnancy. It may be for this reason that the results of pregnancies where the doctor was consulted before the confinement are not favourable. Six women were delivered prematurely, 3 of whom had consulted their own doctor previously ; 16 women were delivered instrumentally of whom 13 had seen their doctor previously (two of them had puerperal fever—the only two that developed this disease—and one died). The number of premature births and instrumental deliveries avoided by antenatal care cannot be ascertained nor can the morbidity of those receiving such care be compared with those who had none. Antenatal work is not carried out by the midwives and, indeed, cannot be properly done by them.

During 1927, 186 babies were born to Droylsden residents ; 17 of these confinements took place in hospitals in Manchester or Ashton-under-Lyne, and among these there was one instrumental labour and one infant not satisfactorily started on the breast.

There is no organised scheme for antenatal work in Droylsden but one midwife, who has now left the district, took great interest in this part of the work, and as a rule paid visits to each of her patients before the confinement was due as well as making urinary tests. Of the 23 cases thus supervised by her alone, 21 were entirely normal and 2 children were stillborn. Of the 12 who consulted a doctor before their confinement, the majority paid one visit only. Nine of these pregnancies were entirely normal, one child was stillborn and one mother suffered from thrombosis ; in one case instruments were used. Fifteen cases had supervision from other sources ; four from the Child Welfare Centre—all normal ; eight from another midwife, with one stillbirth, one premature labour, the child dying under the age of one month, and three children artificially fed—in one case owing to mammary abscess in the mother. Three had supervision from other sources and all were normal. 119 cases had no known supervision before confinement and of these 19 were not in every respect normal ; there were 4 stillbirths and one premature labour, three mothers suffered from ruptured perineum and one had puerperal fever, eight children had to be artificially fed ; one mother had a mammary abscess, and one thrombosis.

Comparing all those who were in any way supervised before the confinement, with those unsupervised, (Table 3) little difference is seen in respect of the more important complications but the proportion of infants unable to be breastfed is slightly greater in the unsupervised and stillbirths among those supervised.

Table III.

Comparison of result of confinements of women supervised and unsupervised.

	No.	Stillbirths.	Premature.	Total Infantile complications.	%
Supervised	50	4	1	5	10.0
Unsupervised	119	4	1	5	4.2

	Not breast-fed.	%*	Maternal complications.			%
			Septic.	Not septic	Total†	
Supervised	3	6.5	1	1	2	4.0
Unsupervised	11	9.6	2	4	6	5.0

* Percentage of live births.

† Ruptured perineum and mammary abscess.

The Postnatal welfare of the infant is cared for in the home by the Health Visitor and at the Child Welfare Centre by the Assistant County Medical Officer also. Most information is available from the records of those attending the Child Welfare Centres, which alone have been used in the following survey.

The proportion of mothers attending the Child Welfare Centres with their babies cannot be accurately ascertained from the figures usually available. Thus for the year 1927, 186 residents in Droylsden were confined, 17 of these away and 169 at home. 184 babies born in 1927 attended the Child Welfare Centre before June 1st, 1928. These figures, however, do not mean that all but 2 babies born to Droylsden residents in 1927 attended the Child Welfare Centre. As a matter of fact only 103 of them did. The 184 babies born in 1927 attending are made up of :—

- 38 Manchester residents, *i.e.*, 20·7 per cent. or 1 Manchester to 4 Droylsden.
- 43 Newcomers to Droylsden since the birth of the baby.
- 103 babies born to Droylsden residents.

Table 4 gives a true idea of the proportion of mothers making use of the Child Welfare Centres :—

Table IV.

	AUDENSHAW.	DROYLSDEN.
No. of pregnancies completed in 1927	123	184
Stillbirths	3	8
*No. of mothers attending	79	103
Proportion of mothers attending to total number of mothers of live children born in 1927	65·8%	58·5%

* Note.—This figure in Audenshaw is to April 1st and in Droylsden to June 1st, 1928.

As regards the *age of the baby* at the time of first attendance the figures are :— of 79 attending Audenshaw Child Welfare Centre,

- 18 were under 1 month at first attendance.
- 34 „ between 1 and 2 months at first attendance.
- 16 „ „ 2 and 3 „ „ „
- 7 „ „ 3 and 6 „ „ „
- 3 „ over 6 months „ „ „

The age of one infant who attended once only is unrecorded.

It is satisfactory to note that 52 out of the 79 attending were under 2 months at the date of the first visit ; but even so only 52 out of the 120 live births, or only 43 per cent., were seen at the Centre before the child was 2 months old.

As regards the age of child at first attendance at Droylsden Child Welfare Centre, the following information has been obtained :—

- Of 41 primiparae
 - 7 attended before the age of 1 month.
 - 21 „ between 1 and 2 months.
 - 8 „ „ 2 and 3 „
 - 5 „ after 3 „
- Of 89 multiparae and 16 of unknown parity
 - 30 attended before the age of 1 month.
 - 36 „ between 1 and 2 months.
 - 24 „ „ 2 and 3 „
 - 15 „ after 3 „

i.e., of primiparae who attended the Child Welfare Centre

- 17% attended before 1 month and
- 51% „ between 1 and 2 months.

Of the Multiparae who attended

- 29% attended before 1 month and
- 34% „ between 1 and 2 months.

One of the chief uses of a Child Welfare Centre should be to encourage *breast-feeding*. The extent to which breast-feeding is practised among those attending the Audenshaw Centre is shown by the following figures :—of the 79 mothers who attended at least once the feeding at 3 months was known in 74 cases only.

Of these :—38 were entirely breast-fed or 51·4 per cent.

10 „ partially breast-fed.

26 „ wholly fed on artificial food, of whom two had never been breast-fed.

The reason for weaning these 24 babies before they were 3 months old appeared to be as follows :—

3 doctor's advice.

4 over feeding causing dietetic trouble.

3 mothers working.

2 illegitimacy.

1 prematurity.

1 mother's health.

1 flat nipples.

9 insufficient milk supply.

As usual, more multiparae than primiparae were successful in breast-feeding their infants. 53·6 per cent. of primiparae and 65·4 per cent. of the multiparae about whom information is available, breast-fed their children entirely to 3 months. The reasons given for discontinuing breast-feeding were :—

4 mother's health.

2 mothers went to work.

*6 milk left or became insufficient.

2 baby cried or vomited.

1 premature.

8 cause unknown.

*Note :—Details about these cases available are as follows. Two were first babies and the milk supply failed at 2 and 5 weeks respectively ; two were later infants and the supply failed in each case at 2 months ; in two cases the parity of the mother was not recorded.

The feeding of 43 infants at 6 months is recorded in the following (Table 5).

Table V.

	Primiparae.	Multiparae.	Unknown.	Total.
Breast	10	18	2	30
Mixed	2	3	...	5
Artificial	3	4	1	8
Total	15	25	3	43

This shows that 66·6 per cent. of primiparae, notes of the feeding of whose children at the age of 6 months were available, were breast-feeding their babies to this age, while 72 per cent. of multiparae were successful.

Feeding of Babies in Audenshaw during 1928.

During 1928 58 babies born in that year were seen at the Child Welfare Centre before January 1st, 1929. Of these, two came once and two others twice only, while one was nine months old on its first attendance. Of the remaining 53 babies, 30 were breast-fed for the first three months of their life ; this number gives a proportion of 57 per cent., which compares well with 51·4 per cent. in 1927.

Of the 23 mothers who failed to feed their babies naturally, the following details are submitted.

16 weaned the baby before coming to the Centre. Of these

2 were illegitimate and were never breast-fed. In 10 the breast milk failed from two to three weeks after the baby was born.

2 babies were weaned on the advice of a doctor or hospital when they were 4 and 12 weeks old.

2 mothers went to work and the baby was not seen again, these were weaned at the ages of five and six weeks respectively.

Of the 10 mothers in whom the supply of breast milk failed from two to three weeks after birth

5 were given advice at the Centre with a view to re-establishment of the supply. Of these five, 2 did not follow the advice given, 2 were thus enabled to breast-feed their babies with some supplementary artificial food, while 1 was unsuccessful in spite of following the advice given.

7 mothers were unable to continue breast feeding although they were doing so when they first attended the Child Welfare Centre. Of these :—

1 was weaned on account of admission to Hospital.

3 were getting along nicely, but the babies cried and so they were weaned; one at least of these was overfed.

2 were weaned during absences of 6 and 8 weeks from the Centre.

1 had indigestion, the advice given was not followed, the baby was weaned and the mother went to work.

The figures given above for the year 1928 tally very remarkably with those for 1927; they show that without a doubt many babies are weaned unnecessarily early. The remedy seems to lie in advice given by the midwife attending as to the need for breast feeding and the precautions to be taken that the milk shall not fail on getting about again; in early visiting by the Health Visitor and further education in the details of breast feeding. It is often forgotten that to feed a baby naturally does not always come naturally but that a little trouble is worth taking and gives remarkably good results.

Health of Welfare Babies during their first 12 months.

Of the babies born in 1927 in Audenshaw information is available regarding 53 who regularly attended the Child Welfare Centre up to the age of 12 months.

The type of feeding seemed to make a considerable difference to the state of health enjoyed; this perhaps does not depend so much on the composition of the food, as on the care given to the baby, since quite a number of babies who are weaned prematurely are deprived of their natural food so that their mothers can go out to work. However this may be, the age at which the first tooth was cut varied from 5 to over 12 months without any apparent cause, and the number of teeth at 12 months of age between 0 and 12; in both these respects artificially, and naturally fed, infants behaved alike. With regard to uneventfulness of infancy, however, there was a great difference as shown in the accompanying table.

Table showing the incidence of certain disorders during the first twelve months of life in certain infants.

Defect.	Artificially fed, wholly or in part before the age of six months.		Naturally fed entirely to the age of six months.	
	No. seen.	%	No. seen.	%
Colds and Bronchitis ...	11*	33	3†	15
Diarrhoea	7	21	2	10
Thrush	3	9	1	5
Septic infection of skin ...	3	9	...	...
Convulsions	1	3	...	...
Exanthemata	2	6	1	3

* 2 of these cases had otitis media, 2 earache and 1 pneumonia.

† 1 of these had earache.

The well known superiority of breast-fed babies is strikingly shown.

It is notable that in the case of these 24 babies, 10 were weaned before the first visit to the Centre and 6 more before the second visit; the reason for weaning the other 8 was overfeeding in 3 instances, mother working and doctor's advice in 1 case each and insufficient milk in 3 cases.

Another item of interest is the fact that a large proportion of those weaning their babies before the age of 3 months was primiparae; 8 out of the 9 where the cause was said to be insufficient milk were primiparae.

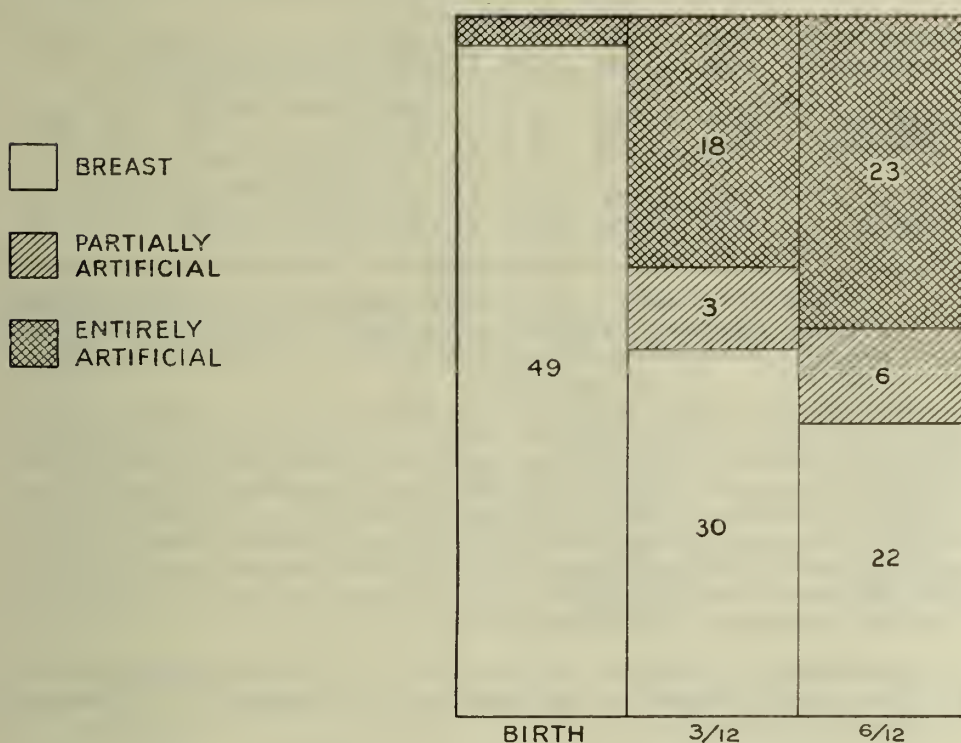
There certainly seems need for greater efforts to be made to obtain more breast-feeding and, apart from education, special sessions during the week should be arranged for the sake of those with failing milk supply to give advice and encouragement.

Of the 38 mothers known to be breast-feeding their babies up to 3 months of age :—

- 22 were wholly breast feeding at 6 months.
 4 „ partially breast feeding at 6 months.
 4 „ entirely bottle feeding.

In 8 cases the child was not six months old when last seen.

In the accompanying diagram the alteration of feeding in the 51 children followed to the age of 6 months is shown ; the great increase of bottle feeding before the age of 3 months and the slight alteration thereafter are noticeable. The feeding of 19 children at 9 months of age is known, 13 were breast-fed entirely or to a large extent, while 4 had been weaned before the age of 3 months, 1 at that age and 1 partially at 6 months, wholly at 9 months.



In the Droylsden Child Welfare Centre the feeding of 87 children at the age of 3 months who attended the Centre is shown in the following table.

Table V.

	Primiparae.	Multiparae.	Unknown.	Total.
Breast only	15	34	4	53
Mixed	5	4	...	9
Artificial	8	14	3	25
Total	28	52	7	87

PREVALENCE OF RICKETS IN AREA 35.

Besides the inculcation of breast-feeding one of the great objects of Child Welfare Work is the prevention of rickets. The prevalence of this disease among school children in Area 35 is one of the tests of the satisfactoriness or otherwise of the Welfare Work done and is one means of comparing the progress made from time to time. The following bony signs were considered to be evidence of rickets :—excessive curvature of the long bones, knock-knees, Harrison's sulcus, pitted incisors, mulberry molars and bossed heads. In all but a very few cases these signs were very slight in degree and in fewer cases still were there evidences of any activity in the disease. Every child coming up for routine inspection in 1928 was examined and in

this manner information with regard to 1,312 boys and 1,359 girls was collected. In the annexed summary of the results the area has been divided into two parts, the one comprised of the Urban Districts of Audenshaw and Droylsden in which are Child Welfare Centres under the care of the Lancashire County Council, and the other of the Urban Districts of Denton and Failsworth, which are autonomous for Child Welfare Work. No comparison is intended and is indeed impossible since the conditions of living, etc., are not comparable.

Incidence of Bony Stigmata of Rickets among Children of Area 35.

			Aged 3-6 yrs.			Aged 7-11 yrs.			Aged 12-14 yrs.		
			%			%			%		
			1	2	3	4	5	6	7	8	9
Audenshaw and Droylsden	Boys	...	195	68	35	181	32	18	149	45	30
	Girls	...	214	47	22	189	40	21	142	34	24
Denton and Failsworth	Boys	...	265	81	31	279	47	17	243	48	20
	Girls	...	283	72	25	289	49	17	242	42	17
Total for Area 35	Boys	...	460	149	32	460	79	17	392	93	24
	Girls	...	497	119	24	478	89	19	384	76	20

Columns 1, 4 and 7 in the above table represent the number of children examined, columns 2, 5 and 8 the number found to have signs of rickets, and columns 3, 6 and 9 the percentage of the number seen found to have rickets.

If all ages be combined, of 1,312 boys 24·5 per cent. and of 1,359 girls 20·9 per cent. were found to show some signs of rickets. From a glance at the above table, the greater prevalence of rickets among boys is seen, together with the fading of such signs after the age of 6 years with a possible reerudefcence after the age of 11 years. It must not be forgotten however that the apparently greater prevalence of rickets among the later ages may mean that rickets was more prevalent among young children some years ago so that any reerudefcence of rickets can only be stated to occur if the group now included in the ages 7-11 shows a higher prevalence of rickets when examined 4 years hence as age group 12-14.

It has been stated that these evidences are almost invariably slight and are not indicative of active disease, but the disease has left its marks on the skeleton and probably on the constitution.

In my experience of the Child Welfare Work in the districts of Audenshaw and Droylsden most of the rickets occurs after the age of 12 months.

There is a certain amount of movement among the population and in all cases some children live outside the limits of the Urban Districts in which they attend for Education; for these reasons the sole responsibility for the occurrence of rickets does not lie with the authorities conducting Child Welfare Work in the districts named.

APPENDIX.

STATISTICAL TABLES IN RESPECT OF THE ROUTINE
INSPECTION OF ELEMENTARY SCHOOLS CARRIED
OUT DURING THE YEAR ENDED 31st DECEMBER,
1928.

TABLE I.—RETURN OF MEDICAL INSPECTIONS.

A.—Routine Medical Inspections.

Number of Code Group Inspections—

Entrants	...	...	...	17,812
Intermediates	...	...	...	12,312
Leavers	...	...	...	12,059
Total	...	...	...	42,183

Number of other Routine Inspections

B.—Other Inspections.

Number of Special Inspections	...	...	...	16,990
Number of Re-inspections at routine medical inspections of schools	...	...	...	20,450
Total	...	...	...	37,440
Number of children examined at re-visits to schools by Medical Officers	...	...	...	41,454
Number of individual children examined by Medical Officers at Minor Ailments Treatment Clinics	...	...	...	7,910

TABLE II.

A.—RETURN OF DEFECTS FOUND IN THE COURSE OF MEDICAL
INSPECTION IN 1928.

DEFECT OR DISEASE.				Routine Inspections.		Specials.	
				Number referred for Treatment.	Number requiring to be kept under observation, but not referred for Treatment.	Number referred for Treatment.	Number requiring to be kept under observation, but not referred for Treatment.
Malnutrition				45	851	11	676
Skin.	{ Ringworm—						
	Scalp	...	...	48	17	42	4
	Body	...	...	25	9	6	3
	Scabies	...	...	23	1	7	...
	Impetigo	...	...	398	111	129	62
{ Other Diseases (Non-Tubercular)				...	...	...	...
				212	240	83	79
Eye.	{ Blepharitis			323	217	103	88
	Conjunctivitis	...	...	96	139	31	40
	Keratitis	...	...	3	4	8	1
	Corneal Opacities	...	...	10	33	7	21
	Defective Vision	...	...	1,645	1,830	924	794
	Squint	...	...	300	430	122	156
{ Other Conditions				...	...	...	...
				9	3	7	5
Ear.	{ Defective Hearing			148	238	80	99
	Otitis Media	...	...	310	64	105	39
	Other Ear Diseases	...	...	134	134	23	27
Nose and Throat.	{ Enlarged Tonsils			738	4,127	230	860
	Adenoids	...	...	101	421	56	115
	Enlarged Tonsils & Adenoids	...	...	472	753	283	413
	Other Conditions	...	...	...	...	...	...
Enlarged Cervical Glands (Non-Tubercular)				...	...	...	...
				28	3,485	10	576

TABLE II.—Continued.

DEFECT OR DISEASE.				Routine Inspections.		Specials.	
				Number referred for Treatment.	Number requiring to be kept under observation, but not referred for Treatment.	Number referred for Treatment.	Number requiring to be kept under observation, but not referred for Treatment.
Defective Speech				37	273	5	72
Teeth—Dental Diseases				4,811	3,868	898	1,207
Heart and Circulation	{	Heart Disease—					
		Organic	20	253	5	128	
		Functional	2	881	3	460	
		Anæmia	42	241	16	144	
Lungs.	{	Bronchitis	156	903	38	210	
		Other Non-Tubercular Diseases	17	246	3	122	
Tuberculosis.	{	Pulmonary—					
		Definite	1	2	1	...	
		Suspected	11	16	7	16	
		Non-Pulmonary—					
		Glands	16	30	6	12	
		Spine	2	5	...	1	
		Hip	3	3	...	3	
		Other Bones and Joints	1	10	1	3	
		Skin	11	7	1	...	
		Other Forms ... ..	...	...	...	...
Nervous System.	{	Epilepsy	3	22	3	13	
		Chorea	3	20	4	19	
		Other Conditions	24	29	11	18	
Deformities	{	Rickets	34	281	18	31	
		Spinal Curvature	42	98	21	33	
		Other Forms	165	597	60	194	
Other Defects and Diseases				335	933	140	355

B.—NO. OF INDIVIDUAL CHILDREN FOUND AT ROUTINE MEDICAL INSPECTION TO REQUIRE TREATMENT (EXCLUDING UNCLEANLINESS AND DENTAL DISEASES).

GROUP.	NUMBER OF CHILDREN.		Percentage of children found to require Treatment.
	Inspected.	Found to require Treatment.	
Code Groups—			
Entrants	17,812	1,447	8.12
Intermediates	12,312	1,440	11.69
Leavers	12,059	1,441	11.94
Total	42,183	4,328	10.26
Other routine inspections ... ..	...	...	...

TABLE III.—NUMERICAL RETURN OF ALL EXCEPTIONAL CHILDREN
IN THE AREA IN 1928.

			Boys.	Girls.	Total.
Blind (including partially blind)	(i.) Suitable for training in a School or Class for the totally blind	Attending Certified Schools or Classes for the Blind ...	12	17	29
		Attending Public Elementary Schools ... ..	...	...	...
		At other Institutions ... ..	...	...	...
		At no School or Institution ...	6	6	12
	(ii.) Suitable for training in a School or Class for the partially blind	Attending Certified Schools or Classes for the Blind ...	21	22	43
		Attending Public Elementary Schools	39	27	66
		At other Institutions ... ..	...	...	...
		At no School or Institution ...	10	4	14
Deaf (including deaf and dumb and partially deaf)	(i.) Suitable for training in a School or Class for the totally deaf or deaf and dumb	Attending Certified Schools or Classes for the Deaf... ..	31	26	57
		Attending Public Elementary Schools ... ..	...	...	...
		At other Institutions ... ..	...	...	...
		At no School or Institution ...	...	2	2
	(ii.) Suitable for training in a School or Class for the partially deaf	Attending Certified Schools or Classes for the Deaf... ..	19	12	31
		Attending Public Elementary Schools	32	21	53
		At other Institutions ... ..	...	...	...
		At no School or Institution ...	1	2	3
Mentally Defective	Feeble-minded (cases not notifiable to the Local Control Authority)	Attending Certified Schools for Mentally Defective Children	4	...	4
		Attending Public Elementary Schools	226	150	376
		At other Institutions ... ..	...	...	...
		At no School or Institution ...	31	25	56
	Notified to the Local Control Authority during the year	Feeble-minded	2	1	3
		Imbeciles	14	10	24
		Idiots	6	4	10
Epileptics	Suffering from severe epilepsy	Attending Certified Special Schools for Epileptics ...	1	2	3
		In Institutions other than Certified Special Schools ...	...	...	...
		Attending Public Elementary Schools	22	12	34
		At no School or Institution ...	9	10	19
	Suffering from epilepsy which is not severe	Attending Public Elementary Schools	104	50	154
		At no School or Institution ...	11	4	15
Physically Defective	Infectious pulmonary and glandular tuberculosis	At Sanatoria or Sanatorium Schools approved by the Ministry of Health or the Board... ..	*	*	*
		At other Institutions ... ..	...	...	...
		At no School or Institution ...	15	18	33

*These cases are dealt with by the County Tuberculosis Committee. Full particulars are published in the Annual Report of the Central Tuberculosis Officer.

TABLE III.—Continued.

			Boys.	Girls.	Total.
Physically Defective (<i>contd.</i>)	Non-infectious but active pulmonary and gland- ular tuberculosis	At Sanatoria or Sanatorium Schools approved by the Ministry of Health or the Board... ..	*	*	*
		At Certified Residential Open Air Schools ... ..	...	...	...
		At Certified Day Open Air Schools ... ..	...	...	...
		At Public Elementary Schools	78	63	141
		At other Institutions ... ..	...	...	...
		At no School or Institution ...	5	9	14
	Delicate children (<i>e.g.</i> , pre or latent tuberculosis, malnutrition, debility, anæmia, &c.)	At Certified Residential Open Air Schools ... ..	...	...	...
		At Certified Day Open Air Schools ... ..	...	...	...
		At Public Elementary Schools	420	342	762
		At other Institutions ... ..	...	...	...
		At no School or Institution ...	22	37	59
	Active non-pulmonary tuberculosis	At Sanatoria or Hospital Schools approved by the Ministry of Health or the Board... ..	*	*	*
		At Public Elementary Schools	65	45	110
		At other Institutions ... ..	...	...	...
		At no School or Institution ...	19	14	33
	Crippled Children (other than those with active tuberculous disease), <i>e.g.</i> , children suffering from paralysis, &c., and including those with severe heart disease	At Certified Hospital Schools...	35	24	59
		At Certified Residential Cripple Schools ... ..	...	...	...
		At Certified Day Cripple Schools ... ..	...	...	...
		At Public Elementary Schools	777	685	1462
		At other Institutions ... ..	...	...	...
		At no School or Institution ...	188	154	342

TABLE IV.—RETURN OF DEFECTS TREATED DURING 1928.

Group I.—Minor Ailments (excluding Uncleanliness).

DISEASE OR DEFECT.	No. of Defects treated or under Treatment during the year.		
	Under Authority's Scheme.	Otherwise.	Total.
Skin—			
Ringworm—Scalp	150	67	217
Ringworm—Body	165	16	181
Scabies	54	10	64
Impetigo	2044	305	2349
Other Skin Diseases	594	235	829
Minor Eye Defects	1157	349	1506
Minor Ear Defects	919	347	1266
Miscellaneous	3674	1060	4734
Total	8757	2389	11146

* These cases are dealt with by the County Tuberculosis Committee. Full particulars are published in the Annual Report of the Central Tuberculosis Officer.

TABLE IV.—continued.

Group II.—Defective Vision and Squint.

DEFECT OR DISEASE.	NO. OF DEFECTS DEALT WITH.			
	Under Authority's Scheme.	By Private Practitioner or at Hospital.*	Otherwise.*	Total.
Errors of Refraction	4311	199	294	4804
Other Defect or Disease	113	...	...	113
Total	4424	199	294	4917

Total number of children for whom spectacles were prescribed :—

(a) Under the Authority's Scheme	3333
(b) Otherwise *	466

Total number of children who obtained or received Spectacles: —

(a) Under the Authority's Scheme	2555
(b) Otherwise *	893

Group III.—Treatment of Defects of Nose and Throat.

NUMBER OF DEFECTS.				
RECEIVED OPERATIVE TREATMENT.			Received other forms of Treatment.	Total Number Treated.
Under Authority's Scheme.	By Private Practitioner or Hospital.	Total.		
1451	329	1780	288	2068

Group IV.—Dental Defects.

(1) No. of children who were :—

(a) Inspected by the Dentist—

Routine Age Groups	Age 5 ...	4961	Total ...	29283
	Age 6 ...	4973		
	Age 7 ...	5677		
	Age 8 ...	4953		
	Age 9 ...	3451		
	Age 10 ...	2348		
	Age 11 ...	1599		
	Age 12 ...	628		
	Age 13 ...	554		
	Age 14 ...	139		

Specials 4754

Grand Total 34037

(b) Found to require treatment 25383

(c) Actually treated 17061

(d) Re-treated during the year as the result of periodical examination 6557

TABLE IV.—continued.

(2) Half-days devoted to	{ Inspection ... 354 Treatment ... 3409 }	Total	... 3763
(3) Attendances made by children for treatment		...	... 29824
(4) Fillings	{ Permanent teeth ... 10622 Temporary teeth ... 3584 }	Total	... 14206
(5) Extractions	{ Permanent teeth ... 7396 Temporary teeth ... 38149 }	Total	... 45545
(6) Administrations of general anæsthetics for extractions		...	... 1866
(7) Other operations	{ Permanent teeth 8839 Temporary teeth 9513 }	Total	... 18352

Group V.—Uncleanliness and Verminous Conditions.

(1) Average No. of re-visits paid to schools during the year by the School Nurses	...	...	...	...	5.99
(2) No. of children examined at these re-visits	...	...	...	...	172553
(3) No. of children found unclean	...	...	...	...	5525